AUG 29 1892
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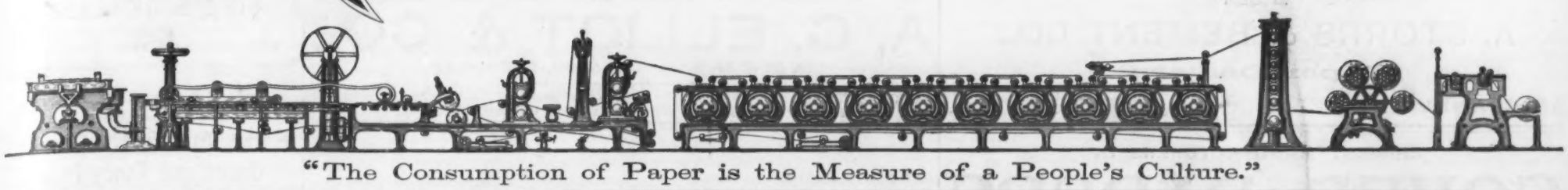
THE PAPER TRADE JOURNAL.



"The Consumption of Paper is the Measure of a People's Culture."

VOLUME XXI.—NO. 35. NEW YORK, AUGUST 27, 1892. WHOLE NUMBER 956.

Trade Topics.

Revolving Suction Box.

An illustration is given of a new suction roll for paper making machines, consisting, essentially, of a hollow roll or cylinder divided into longitudinal compartments, arranged to be successively exhausted of air and presented to the inner surface of the paper carrying medium and suck therefrom the water contained in the layer of pulp deposited on the outer surface thereof as the roll is revolved, and means for exhausting the air from the compartments.

Figure 1 is an end view of the suction roll; Fig. 2 is a longitudinal section at the dotted line X X in Fig. 1; Fig. 3 is a top plan view of the roll, denuded of a portion of its wire cloth covering; Fig. 4 is an end view of the suction roll with the suction valve removed therefrom; Fig. 5 is a view of the inner face of the suction valve—that is, the face that is next to the suction roll in Figs. 1 and 2; Figs. 6 and 7 are enlarged detailed views of parts shown in Figs. 2 and 4.

A is the suction roll considered as a whole, mounted on an axis, A', having bearings A^2.

A^3 is an interior centrally located chamber intended simply to diminish the capacity of the roll to contain air, and may be of any suitable form and construction.

A^4 are radial partitions dividing that portion of the interior of the roll lying outside of the chamber A^3 into longitudinal compartments, A^5, which in the cylinder shown are twelve in number.

A^6 are partial sub-partitions extending transversely between the outer ends of the radial partitions A^4 to form the ways A^7.

A^8 A^9 are rings and wire cloth forming the periphery of the roll in the usual manner. Wherever a wire cloth paper carrying medium is employed in lieu of one of felt or other material, the wire cloth covering A^9 of the roll may and had better be dispensed with.

A^{10} are adjusting heads adapted to slide in the ways A^7 and should be made of some elastic, non-porous substance or have the surfaces which are in contact with the roll provided with packing suited to form air tight joints between the heads and the sides of the ways.

A^{11} are screws for actuating the adjusting heads A^{10}, and are mounted in bearings, A^{12}. Whenever it is desired to slide any head in its way, apply a handle to the end A^{13} of the screw A^{11}, and revolve it until the head is caused to travel to the proper place. The function of the ways and heads is to render the roll longitudinally adjustable in order to adapt it to be used in making paper of any desired width.

B is a stationary suction valve, the inside of the flange B' whereof is fitted to the annular head A^{14} of the roll, forming an air tight joint therewith, the joint, however, not being sufficiently close to prevent free revolution of the roll A. The interior of the valve B is simply an annular chamber B^3, having a port, B^4, in its inner face registering with the open or port ends of the compartments A^5 in the roll A, and a port (not shown) opening into the suction pipe B^4. The dotted lines X' in Fig. 1 indicate the outlines of the port B^3, registering with the port ends of five of the compartments A^5 in the roll A. The lower end of the port B^3 is shown in section in Fig. 2, the lower portion of the annular chamber B^3 opening through the port B^3 into the port end of one of the compartments A^5, and the upper portion of the chamber B^3 being shut off from communication with the compartments A^5 by means of the inner face of the valve B. Obviously, if desired, the port B^3 could be made of greater or less dimensions than shown or so constructed that its size might be regulated by means of a slide or otherwise.

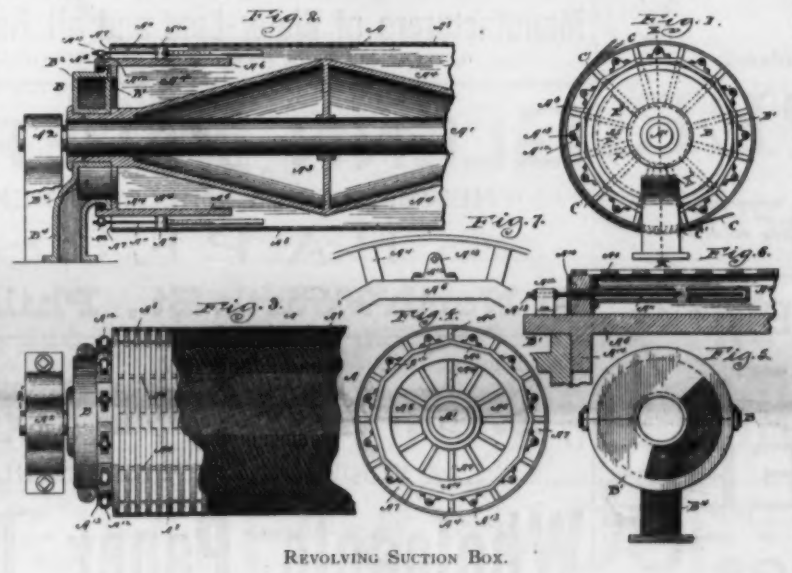
B^4 is a suction pipe connecting the valve B with a suction pump or exhauster.

C is so much of a felt or other paper carrying medium as is contiguous to the five compartments A^5.

C' is a layer of pulp to be converted into paper.

If suction is applied to the pipe B^4 the air contained in the five compartments A^5 (see Fig. 1) contiguous to the port B^3 would be drawn out of the five compartments through the port B^3 into the valve B and through a port (not shown) in the bottom of the valve B into the pipe B^4 and from thence out through the exhauster. The partial exhausting of the five compartments A^5 would produce a powerful suction immediately below the layer of pulp C', and a large percentage of the water contained therein would thereby be drawn down through the medium C into the compartments A^5 and pass out through the port B^3 into the valve B and thence into the pipe B^4. Evidently if the roll A were continuously revolved the compartments A^5, as fast as they registered with the ports B^3, would be partially exhausted of their air, and the operation of sucking the water out of the layer of moving pulp or strips of partially formed paper into the partially exhausted compartments A^5 of the roll would be continuous.

In the mechanism described the entire force of the exhausting apparatus is constantly directed to that portion of the periphery of the suction roll which is adjacent to the strip of saturated partly formed paper, the paper carrying medium C being in close contact below with the perforated periphery of the roll A, and above with the paper C'.



Revolving Suction Box.

Trials and Triumphs of a Millwright.

Twenty-fourth Paper.

[WRITTEN FOR THE JOURNAL.]

By James F. Hobart.

Tramp has already noted the pleasure (?) experienced in burning oil for fuel when making steam. New material in that line was constantly turning up, not only in his mill but with other concerns which were trying, if not to get "something from nothing," to at least get everything out of the little of which they came into possession. No one can blame them for the latter effort. In a mill near where Tramp was employed they had an experience which, if the owner of the mill was not so deeply interested in it, would probably result in the oil system being abolished in that mill and a return made to good, honest coal.

It happened in this manner: The oil is first pumped into a converter, and changed into gas; then the gas is blown into the combustion chamber under the boilers, a pressure of 40 to 60 pounds per square inch being frequently maintained on the gas supply. Steam is used in making the gas, the whole process being the subject of letters patent. The mill had been stopped many times during the two or more years the system had been in use, and some of these stoppages were caused by failure of the system, others by failure of the boilers under the heavy firing, which was caused partly by the lack of sufficient boiler room, and partly by the terrible flame produced by the burning gas.

Some of the stoppages had been caused by lack of oil, the substance being supplied from the Pennsylvania oil fields in the usual tanks in which oil is transported by rail. It was unknown to the public whether the failure to receive oil was due to the railroad facilities or whether it was due to a failure of the paper company to connect financially, at proper intervals, with the oil company. At any rate the failure existed, and the mill was frequently for two, three and, once or twice, even four days without oil or without enough to run a great length of time.

In the instance which happened very lately the accident was in the bursting of the feed pipe which supplied the gas producer with oil. It is nothing remarkable for feed pipes to burst when they are connected with steam boilers, and there it does no particular harm and special precautions to prevent its happening once in ten years or so are not needed; but in this case it is different. The oil is combustible and when it gets away there is trouble. This is precisely what happened. The feed pipe burst and the oil went all over the inside of the fire room. The pipe burst in such a place that the oil was ignited, and in a very short time the whole interior of that boiler room was a sheet of flame. The building caught fire so quickly that the whistle could not be blown, neither could the fireman get at the steam pump to stop the stream of oil, which was making the matter worse all the time.

Something like 45 pounds pressure per square inch is used in forcing the oil into the converters under this system, and a pump running very slowly under that pressure will jump up to a pretty high speed when the pressure is removed by the bursting of the pipe which carries the oil. There should in future, in every mill where oil is used as fuel, be some provision made for the protection of the plant from a similar accident. The oil feed pump is usually located on one side of the converter, about 2½ feet from the ground, and to stop the pump, a man must go to the converter, reach up and operate a globe valve placed 5 or 6 feet from the ground.

The oil tanks are always, or always should be, located at a distance from the fire room and buried in the ground. To make the plant decently safe nothing is needed, so far as protection from feed pipe bursting is concerned, than to put a valve outdoors, so that the oil supply can be cut off without going into the boiler room. The old pipe usually runs from the tank to the pump under ground, but it would not cost much to bring the pipe up above ground just outside of the fire room, and put a valve waist high on the wall, then run the pipe to it and again carry it underground. If, as is sometimes the case, the oil is so poor that it will freeze in cold weather, the pipe can be carried straight into the building and the valve placed in the line at the point where the pipe passes through the wall into the fire room. Then a long stem can be rigged to turn the valve and carried above the surface of the ground through a piece of old steam pipe. The handle by which the rod is turned may be inclosed in a box with a glass cover, which can be broken if it becomes necessary to use the valve. Such a contrivance would have saved $1,000 in the fire mentioned, and such a fire is always possible where oil is used.

A good many mills still use the old-time paper cutter with its gears and striker dog, and the managers of such mills are troubled as much as ever by the wear of the dog. It will wear off on one side, and one edge of one side at that, until the back of the dog strikes before the end does. Then there is trouble and the millwright is called upon forthwith. In a case of this kind Tramp tried the experiment of grinding off one corner of the dog and fitting a piece of steel thereon. The steel corner was ground to about the desired shape, so that only a very little metal would have to be removed after the piece was fastened in place. Then the steel corner was laid in place, taking care that its surface and that of the dog were perfectly bright. Then the corner was tied in place with fine iron wire.

In case the iron wire is not at hand get a piece of window netting and unwind that. The filling, after being snubbed across the end of a board to get the weaving kinks out, will answer very well for binding wire. It will do, even if, as sometimes happens, the wire is of brass, for it is such hard brass that it will not melt much easier than iron wire, and so serves to hold the pieces together until the brass melts. Having tied the pieces as tight as possible, remembering that they will not be as tight after the wire gets hot and stretches, dust on some powdered borax and lay on a bit of spelter or soft yellow brass. Don't try to use the borax without grinding. It will prove a nuisance. An old coffee mill (a new one would do, too) should be provided in every blacksmith shop for the purpose of grinding borax for welding, and prussiate of potash for case hardening. If there is nothing to grind the borax with, just put some in the hollow place on the top of the sow, and then you can rub down a little borax there with a round faced hammer. Once the borax is ground—and it ought to be sifted to prove the grinding—put it in a tight tin box and it will not air slack or otherwise deteriorate.

The size of the brass piece needed can be determined after one or two trials, bearing in mind that if there is not enough the weld or braze will not be perfect, while, if there is too much brass, it is only a matter of grinding off the surplus after the dog has been cooled. With everything in place and plenty of borax on to keep the air from oxidizing the surfaces of the metals, place it in a clean fire of charcoal or well coked Cumberland (bituminous) coal and heat gradually. The heating should be so managed that the small steel corner will get just as hot as the large piece, and this is the secret of good brazing. The tendency is for the large piece to get hot first, leaving the small one of a darker color. As long as this point is looked after the heating may be forced as much as desired; but usually the slow heating is a condition of even heating.

Watch the heating very closely, and when the brass begins to smoke its melting may be hastened and made complete by touching it with a small red hot rod—the poker will do—and as the brass is brought closer into contact with the red hot iron it melts and runs quicker. The instant this point is reached remove the work from the fire and cool. In this case it was plunged into cold water to harden the steel. The emery wheel soon made a fine looking job of the worn out dog.

Press for Forming Hollow Articles from Pulp.

In the process of forming pails the body of the pail is wound upon a form from pulp or paper stock, layer upon layer. This may be done either with little or much pressure on the couch roll, forming the pulp either into a soft, uncompressed mass or a firm mass from which the water has mostly been pressed out.

A new device to press the pail body and at the same time to put in or form a bottom for the pail, so that the body and the bottom will be perfectly united, and the pail when completed will be integral throughout, has been invented.

The press consists of a casing the upper portion of which is cylindrical and the lower portion flaring or conical. The flaring portion of the casing is lined with overlapping pervious sections, each of which is connected with the casing by suitable guides, so that it may have a limited longitudinal motion, whereby the inner diameter of the casing is expanded or contracted. A pervious former is made to enter the flaring end of the cylinder, this former being provided with means for raising and lowering. Fitting the cylindrical upper portion of the casing is a plunger adapted to be forced down upon the head of the former when the latter is in position within the casing. The unpressed body of the pail is placed on the former and raised up into the casing, the staves or sections being lifted simultaneously as they come in contact with the lower portion of the former. The staves or sections are thus brought together around the surface of the former as the latter is forced into the flaring portion of the casing. Pulp is introduced into the upper portion of the casing and molded by the plunger to form the bottom of the pail, the upper edge of the wound body uniting in this operation with the molded bottom.

The operation of the press is as follows: The wound pulp body is slipped on over the former. When the latter is at its lowest position the sections are expanded, the lower ends projecting to a considerable distance below the ends of the casing. The former is raised and the base enters the space between the sections or staves, the lower ends of the sections impinging on the flange which surrounds the lower end of the former. As the former is lifted to its position within the casing the staves are contracted about it, and thus press the pulp which forms the sides of the pail. When the staves have come together and the casing comes to a bearing on the base of the former, the casing itself is lifted bodily, pulp being admitted into the cylindrical portion of the casing above the former. As the casing is lifted the plunger enters it, pressing the wet pulp down against the head of the former and forming the bottom of the pail. The upper end of the pail body, which is allowed to project somewhat above the top of the former, unites with the pulp introduced above and is compressed by the plunger, so that the body and bottom of the pail are made integral.

The device may be modified in many details. For instance, a casing may be held stationary and a plunger brought down from above and the former up from below.

The exact cost of making paper money has been figured out by taking the actual cost of printing notes for ten months from July 1, 1891, to May 1, 1892, at the Bureau of Engraving and Printing, and adding the cost of the distinctive paper from the Government mill, the clerical labor of handling the money in the Treasury and expressage to the places of issue. This makes the cost of each sheet, without regard to denomination, 6 cents, 2 mills and 4-10 of a mill, and the cost per note just one-fourth of this, or 15 mills and 6-10.

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Correspondence.

St. Louis Notes.

[CORRESPONDENCE OF THE JOURNAL.]

ST. LOUIS, Mo., August 23, 1892.

Without preamble or apology your correspondent assumes with becoming modesty the task of letting in the light which the columns of THE JOURNAL alone can shed upon this important and hitherto comparatively neglected paper market.

By neglected I refer only to the absence of newspaper prominence, for St. Louis has long been recognized as in the first rank in the distribution of the "civilizing staple."

This statement will receive the indorsement of the many mills which look to St. Louis to help supply their omnivorous appetites for orders, and is also confirmed by the fact that the present volume of business amounts to about $7,000,000 in value.

This amount embraces only the sales of local houses and does not include sales of mills direct to the consuming trade.

While speaking of mill solicitation of the small trade it may not be inappropriate to remark that this method of doing business is provoking much quiet comment among the jobbers, and while there will be no concerted action regarding it there is a strong undercurrent of feeling on the subject which will make itself felt in no uncertain way, although the long suffering jobber "grinds slowly," like the "mills of the gods."

But a pleasanter view of the future is the certainty of prosperous times during fall and winter in all lines of trade.

The Western and Southern crops are assured sufficiently to warrant so positive a statement.

While the general outlook is bright it is especially so for St. Louis, whose citizens long ago learned the art of crowd gathering and this year will reap the harvest of the persistent and intelligent effort which has given the city a national reputation for its fall festivities.

After gracefully giving the world's fair to needy Chicago we did not repine over our excessive generosity, but went to work to offer attractions in the carnival line which no other city has ever equaled and which are entirely unique.

The series of electric street displays and illuminations emblematic of Columbus' visit which will be given during the coming two months will be unrivaled in attractiveness and promises to tax the city's entertaining capacity to the utmost with guests from all parts of the country.

To illustrate the magnitude and scope of the work it is only necessary to state that there has been an outlay of over $500,000 for the purpose.

I go into this matter so fully as it marks a new era of prosperity and because the paper trade has contributed liberally in money and effort to bring it about, and because—most important of all—it means more paper.

The Typothetæ meeting in Toronto naturally commands great attention and deep interest, not only on account of the importance of subjects now on the surface, but because the local representatives are (as are the members of the Typothetæ generally) men of standing in the community whose deliberations are of the history making order, and while the subjects under discussion do not all bear upon the paper trade, many of the themes are of vital interest as inceptions of changes and innovations.

It is gratifying to local pride that St. Louis is so prominently recognized in the organization for the ensuing year.

The annual disturbance occasioned by vacations is rapidly nearing its end, and proprietors are resuming their serenity over the prospect of business being resumed in a normal way. Speaking of vacations I learn that Ben Brown has gone for a much needed rest after the tedious and confining labor of reorganizing Geo. R. Dickinson & Co.'s business here to accord with his policy. W. G. Chappell has returned from his outting and reports trade as good.

I judge that F. O. Sawyer & Co. can give the same hopeful report, as they have recently greatly increased their store room and now present a handsome frontage.

Libby & Williams are busy, as is also the American Roll Paper Company.

I also learn that the Graham Paper Company's trade is heavy at home and at its Kansas City, San Francisco and St. Paul agencies.

F. D. Bull has resigned as vice-president and manager of the American Roll Paper Company, and as he is the recognized head of the paper holder and cutter business in the country interesting developments may be looked for in the near future. Mr. Gray, of Worcester, and Arthur Hill, of Holyoke, have cared for the envelope interests here recently.

Ex-Police Commissioner B. F. Reist saw that "no guilty man escaped" the Mead Paper Company.

Mr. Davenport has been here distributing witticisms and prices for the Powers Paper Company.

Mr. Darnall, of the New York and Pennsylvania Company, paid one of his meteoric and businesslike calls.

J. B. Halliday, of Chicago, and E. G. Church, of Rock Falls, Ill., are here to-day on wrapping paper business. D.

Holyoke Notes.

[FROM OUR REGULAR CORRESPONDENT.]

HOLYOKE, Mass., August 25, 1892.

This has been rather a quiet week and nothing of unusual importance has happened. Manufacturers agree pretty well in the statement that business is as good as could be expected at this season of the year. The volume of trade has been very well maintained since summer came and prices have changed very little in comparison with those of a year ago. Very little is said now in regard to overproduction and the product is well covered by orders. There is little to say about the stock market, the demand in this line being circumscribed.

The improvements which have been going forward at the mill of the George C. Gill Paper Company are as good as finished. The company has expended considerable money of late, and the plant is now in better shape than ever. The most important feature has been the erection of a new boiler house, which will accommodate four new tubular steam boilers of 100 horse power each. These will take the place of three old ones, and each will have a capacity of 600 tons of coal. A new heater house has also been built and a new heater has been put in. A new size house has been added to the plant. The fire service has also been increased.

Good progress has been made on the new Linden paper mill during the past few weeks. The extension of the canal is nearly finished, and the solid stone bank walls will soon be done. Work on the buildings is being pushed rapidly, and the brick walls are beginning to rise, some already being up one story, while the foundations are being placed under others. It is the intention of the company to have the new mill one of the most thoroughly constructed, and money and pains will not be spared to bring this about.

William Graham and Michael Galiel, two laborers employed by Casper Ranger on the addition to the Whiting No. 2 Mill, were injured on Monday night by the caving in of a bank near the new building. The men were digging a large trench for a water pipe when the earth caved in suddenly, burying them. They were quickly extricated, and escaped with a few bruises.

Train, Smith & Co., the well-known Boston stock and paper dealers, have opened a branch of their business on the first floor of the Whiting Street Building on Main street.

William H. King, the well-known paper stock dealer, of Springfield, died late last week of heart disease. Mr. King had been in business many years and had a large number of friends in this city.

Long & Walsh, the local boiler makers, recently furnished the pen stock for the Carew Manufacturing Company, of South Hadley Falls, and an iron smokestack and steel flooring for the George C. Gill Paper Company. The firm's business is steadily increasing and the force of workmen is being added to.

Would-be burglars entered the residence of Moses Newton, on Elm street, one night this week, but were frightened away before they could obtain any booty. A young son of Mr. Newton heard the men moving about in his room, and as soon as an opportunity presented itself the young man slipped out of bed and went to his father's room. Mr. Newton is a very sound sleeper, and it took some time to awaken him. The intruders, probably hearing the noise, made good their escape by a back door.

Almado Davis, foreman for the Holyoke Hydrant and Iron Works, while at work in a wheel pit at Collinsville, Conn., recently had a fall which will confine him to his house for a time. He was descending into the pit and slipped on the rope, falling a distance of 25 feet and fracturing an ankle. Mr. Davis lives on Laurel street in this city.

The Hampshire Paper Company, of South Hadley Falls, has broken ground for its new stock house, and the work will be done as rapidly as possible. Lynch Brothers, of this city, have the contract.

Annie Giroux, the young woman who was taken to the smallpox hospital recently, is likely to recover. No new cases have been reported and the quarantine has been removed from the block where the victim lived.

Hon. William Whiting has gone to New York to meet his son, W. F. Whiting, who has just returned from a European trip.

L. F. Hayward, traveling salesman for the Valley Paper Company, started on a Southern and Western trip Saturday. H.

Boston Notes.

[FROM OUR REGULAR CORRESPONDENT.]

EASTERN OFFICE PAPER TRADE JOURNAL,
67 Federal Street,
BOSTON, August 25, 1892.

Reports from the local trade who seem to be in close touch with business developments would indicate a very good movement in paper.

The bulk of the business, so far as the demand applies to print papers, is from distant fields, the call from city consumers being rather limited at the present time.

Jobbers of manilla and wrappings, however, say that the local demand for this line of paper is very good.

With the close of the summer season, and the end of the season is not far off, trade generally will pick up and print paper will move more freely.

The present condition of the paper stock market is marked by uncertainty on account of the cholera appearing on the Continent and the probable action of the local

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and Government authorities concerning the importation of rags, and such action, it is feared, may be hurtful to business. So far the markets abroad and here have kept along quite evenly as regards values and shipments have been received without much interference, but the fear of more stringent regulations owing to the spread of cholera, and possibly the prohibition of rags from other countries besides France, is causing some little anxiety. Just what the future may develop is dependent upon the action of the health authorities, and until their actions are made known predictions concerning the future are all speculation.

Nothing has come to pass during the past week to warrant importers in banking upon anything positive and so they are forced to await developments.

The imports of paper stock for the past week include 2,199 bales of rags, 128 bales, 448 coils of manillas, 1,038 bales of waste paper and 635 bags of sizing.

Receipts of chemicals were 829 casks of bleaching powders, 252 drums of caustic soda, 185 casks, 280 bags of soda ash and 500 bags of crude sulphur.

Bleaching powders are very scarce, both on spot and on the way, and nothing is offered under 2.30c. either for store or early arrival; 2.95@3c. is the quotation on caustic soda, while soda ash still holds at 1¼@2c. and soda crystals at 1.07½@1.10c.

J. Glover Smith, formerly with F. W. Bird & Sons, but now a resident of the Pacific Coast, was in town this week. Mr. Smith is the Pacific Coast representative of F. W. Bird & Son, and also of Stone & Forsyth, and came East on business.

Other recent trade visitors were John Watson, of Loadville, Mass.; Charles E. Callendar, of Glendale, Mass.; Sam Rust, of Holyoke, Mass.; Charles Mayo, of Lawrence, Mass.; Orin Robertson, of Hinsdale, Mass.; George H. Russell, of Bellows Falls, Vt.; R. N. Stanley, of Manchester, N. H.; E. B. Weston, of Dayton, Ohio, and Siegfried Salomon, of New York.

William B. Tyler, for the past four years with Stone & Forsyth, has taken the management of Osborn & Wilson's (New York) Boston business.

W. J. Thompson, Osborn & Wilson's former Boston manager, has gone into the paper business on his own account and is meeting with success.

Stone & Forsyth have established a plant for printing wrapping paper, bags and flour sacks. The printing rooms are located in the firm's new building, an extension recently added to the Devonshire street store. The equipment consists of three large Cottrell cylinder presses, two job presses, paper cutters, type, &c., and the printing room is under the charge of George E. Tidd, an experienced printing office foreman. The establishment of such a plant is noteworthy for the reason Stone & Forsyth is the first paper house in Boston to establish a printing office in its own store quarters, and this step became necessary because of the firm's constantly increasing business in printed wrappers.

Thomas H. Hubbard, representing Pulsifer, Jordan & Co., returned this week from a Western tour and reports having had a very prosperous trip.

Robert C. McQuillen, president of the A. Storrs & Bement Company, has returned from his vacation outing.

Col. E. H. Haskell is spending the week at Gloucester, Mass., one of the old towns of the State, which is now celebrating its 250th anniversary, and of which town the colonel is a native.

H. M. Knowles, treasurer of the Glen Manufacturing Company, left town Monday last for Campobello, Me., to join his family, and there will he sojourn for a couple of weeks.

David Ring, of M. A. Ring & Son, is spending a few weeks at Hingham, Mass., enjoying the hospitalities of the Crow Point Club.

E. Storey Smith, of Train, Smith & Co., is getting his vacation in broken doses. Since locating his family on Long Island two weeks ago, and where he expected to remain also until the end of the month, he has made a trip or two to New York city, taken a run on to Washington, D. C., and spent a few days of this week in Boston, all on account of some French rags that the Government thought might have a cholera germ in 'em. This is combining business with pleasure in a true sense, but it is a bad combination for a man off on his summer vacation. DELESDERNIER.

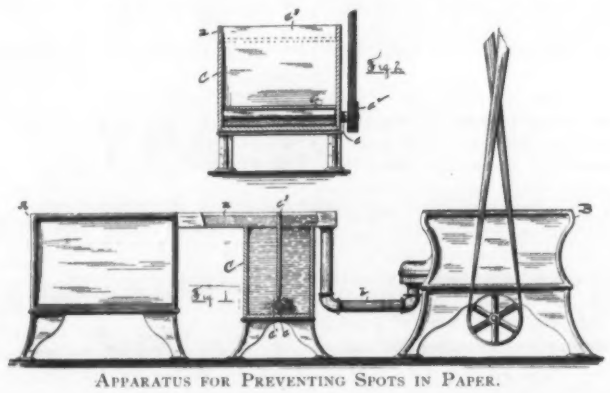
New Patents.

No. 480,334. Process of Preparing Cellulose from Wood.—Hermann A. A. Maste, Arnsberg, assignor to the Vereinfür Zellstoffindustrie Actiengesellschaft, Dresden, Germany.

No. 480,446. Means for Preventing Spots in Paper.—Robert W. Allan, Fairfield, assignor of one-half to Roswell M. Fairfield, Holyoke, Mass.

Prevention of Spots in Paper.

In the manufacture of paper, particularly fine writings, the rapid vibration of the screen frequently causes the formation of drops of the stuff, which fall upon the surface of the stream of stuff issuing from the screen, and there being no intervening agitator to disintegrate the drops they are carried to and upon the machine, and the bluing matter contained in them causes a blue spot in the paper. Again, it often happens that lumps or collections of stringy or fibrous matter remain in the stuff after the latter has passed through the screen, and these also cause a blemish.



APPARATUS FOR PREVENTING SPOTS IN PAPER.

It is stated that all such causes of blemish in the paper can be removed by introducing into the path of the stuff, between the screen and the machine, an agitator and by compelling the stuff to pass through it. Such an agitator is the subject of the illustration herewith given, in which Figure 1 illustrates the position of the agitator in its relation to the machine and the screen, Fig. 2 representing a longitudinal vertical section of the agitator.

The usual trough or conduit leading to the machine is shown at *a*, and the pipe *b* conducts the stuff from the screen into this trough.

The agitator C consists of a rectangular box supported upon suitable legs or standards and having centrally located near its bottom a shaft, *c*, provided with short paddles, *c'*, projecting radially therefrom, the shaft having its bearings in the ends of the box and carrying at one end band pulley c^2, whereby motion can be transmitted from a suitably disposed countershaft. A central partition, c^3, is secured to the ends of the box, extending downwardly to within a short distance of the shaft. Substantially one-half inch of space is left between the outer ends of the paddles on the shaft and the bottom of the box and between the ends of the paddles and the bottom of the partition c^3.

The agitator can be located at any point between the screen and the paper machine, but it is preferably located at some point in the trough or conduit *a*, as shown in Fig. 1. When thus located the top of the box makes a tight joint with the bottom of the trough, and a portion or all of the bottom between the sides of the box is removed to afford open communication between the trough and the box.

The central partition, c^3, of the box is extended upwardly to a point where its upper end is flush with the sides of trough *a*, as shown, and thus compels the stuff to pass downwardly upon one side beneath its lower end and upwardly upon the opposite side in its passage from the screen to the machine.

As the stuff passes beneath the partition the rapidly revolving shaft *c* thoroughly agitates every portion of it, diffusing the globules or drops and disintegrating the lumps or collections of stringy and fibrous matter, which would otherwise cause blue spots and other blemishes in the paper, in such manner that the paper issues from the machine free from blemish. A very material saving to the manufacturer is thus secured by the use of the apparatus.

Obituary.

WILLIAM H. KING.

William H. King, paper stock dealer, for many years a prominent merchant of Springfield, Mass., died very suddenly on August 18. Mr. King was about his business the day before and was apparently in the best of health. He left his office soon after 6 o'clock and during the evening complained of not feeling well and started out to see his physician, Dr. Hawkins. The doctor discovered no serious trouble, but told Mr. King that he had better go to his cottage at Lake Pleasant, where his wife is spending the summer, for a week's rest. He returned home and remarked before retiring that he thought he would be all right in the morning. Early in the morning he was found in his room dead. Drs. Breck, Hawkins and Adams were summoned, and pronounced his death due to heart failure and it is supposed that he died soon after midnight. Mr. King was a large man, weighing over 200 pounds, and had scarcely known a sick day in his life.

William H. King was born at Suffield, Conn., in October, 1827, and when a young man went to Springfield and began business as proprietor of a grocery store on Main street, a short distance below State. Later he built a block at the North End and for a time manufactured balmoral skirts. He was afterward interested in the Sciantic Paper Mill, at Hampden, where he lived for several years. Moving from there he resided for a while in Paterson, N. J., where he first entered into the paper stock business. Returning to Springfield in 1876 he continued the same business and opened a store on Worthington street, where he had since then been associated with his two sons, William H. King, Jr., and J. B. King. Mr. King's first wife was Elizabeth Stead, of Sheffield, England, who died many years ago. His second wife was Harriet Bidwell, of Windsor Locks, Conn., who survives him. The surviving children are William H., John B. and Ida, wife of Henry Chapin, of this city, and Mary, wife of A. W. Hayden, of Waltham.

Edward A. Cort, printer, Newark, N. J., is dead.

Thomas Ralston, stationer, Tremont, Wash., is dead.

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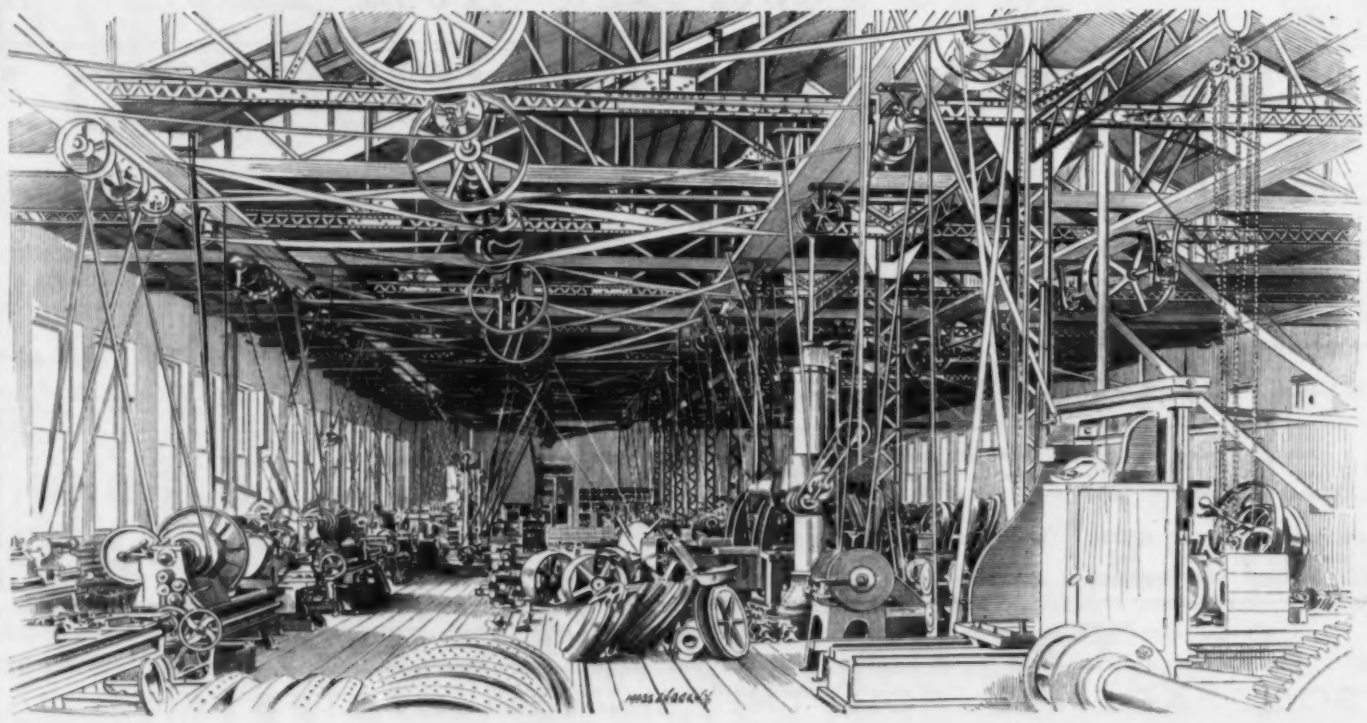

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10 Railroad Ave.,
East Berlin, Conn.

The accompanying illustration is taken direct from a photograph and shows the interior of a Machine Shop with an Iron Truss Roof, designed and built by us for the Titusville Iron Co., at Titusville, Pa. The building is 70 feet in width by 205 feet in length. The roof trusses are made entirely of iron and designed to carry shafting. Through the centre of the building is a row of wrought iron columns. For Machine Shop Roofs this plan particularly commends itself, as the trusses are not only much neater in appearance than heavy, cumbersome wooden trusses, but are stronger and stiffer; and where no wood is used about the building the danger from fire is entirely eliminated.

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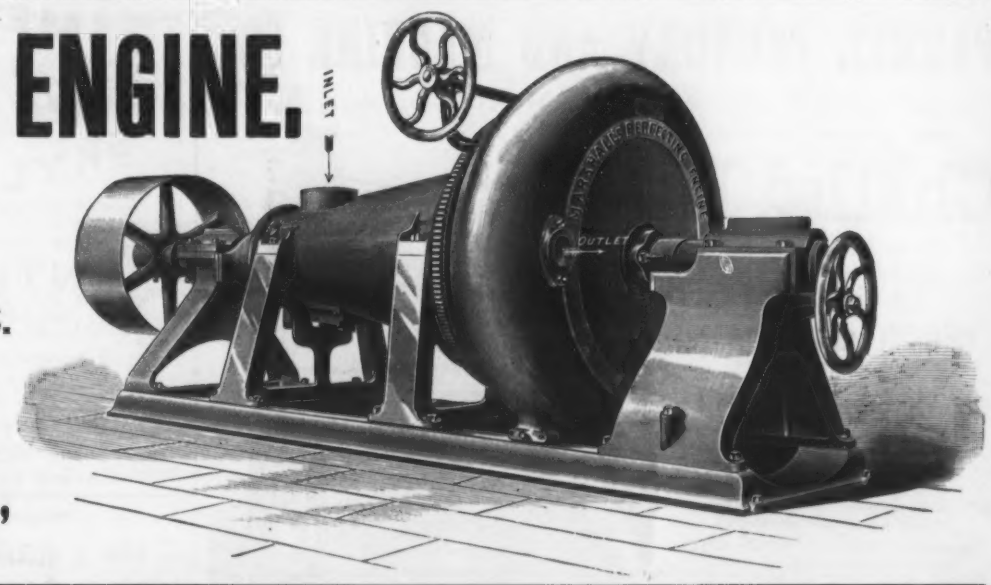

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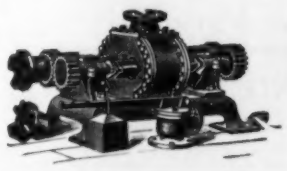

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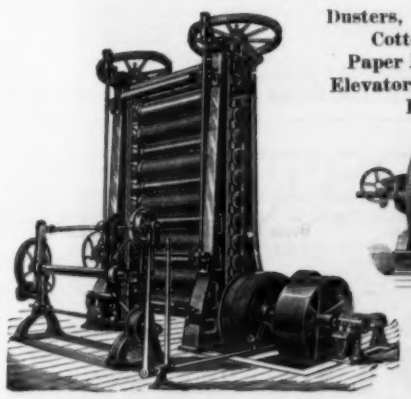

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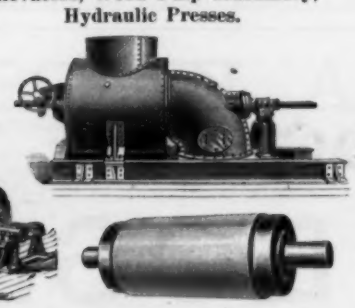
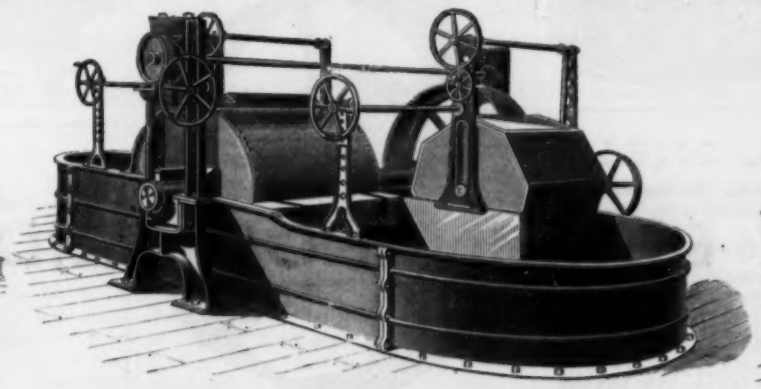
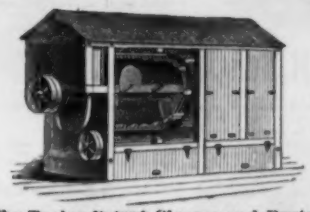
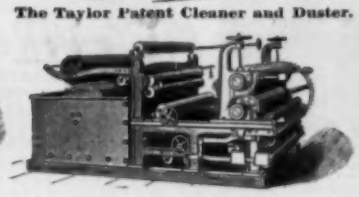
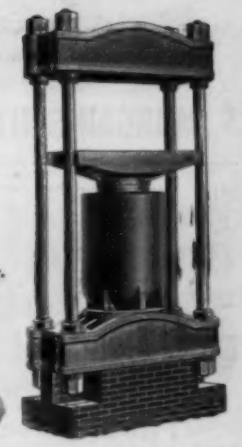






The Taylor Patent Cleaner and Duster.





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WATERTOWN, N. Y., August 12, 1890.

THE BAGLEY & SEWALL CO.:

GENTLEMEN—The following is the record of the 86 inch wire Fourdrinier Machine purchased of you for the past week:

August 4, . . 24,335 lbs.	August 6, . . 24,020 lbs.	August 8, . . 23,337 lbs.
August 5, . . 23,390 lbs.	August 7, . . 24,010 lbs.	August 9, . . 24,865 lbs.

Average per day, . . . 23,992 lbs.

These figures are the net shipping weight of the paper, averaging 31 lbs. to the ream, 24 × 36 in.

Yours respectfully, E. B. STERLING, Sec'y.

FRONTENAC PAPER CO.,

DEXTER, N. Y., August 20, 1890.

BAGLEY & SEWALL CO., WATERTOWN, N. Y.:

GENTLEMEN—At 8:30 to-night our machine tender shut down to put on a NEW FIRST FELT. The paper was off the reel less than ELEVEN MINUTES. It cannot be done on any other make of machine than the BAGLEY & SEWALL.

Hastily,

F. W. SPICER, Sec'y and Treas.

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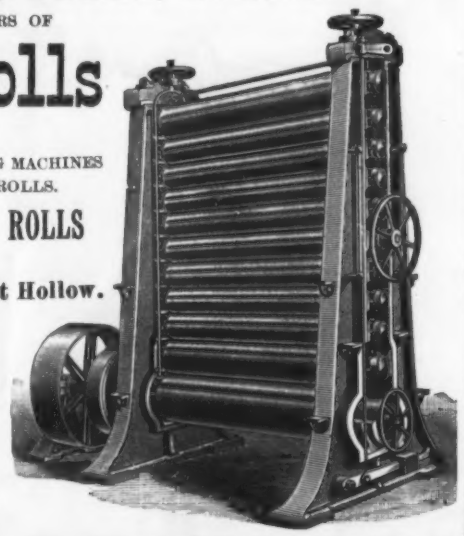

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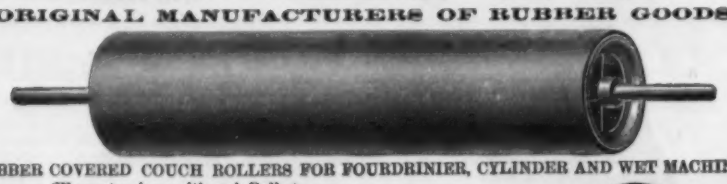

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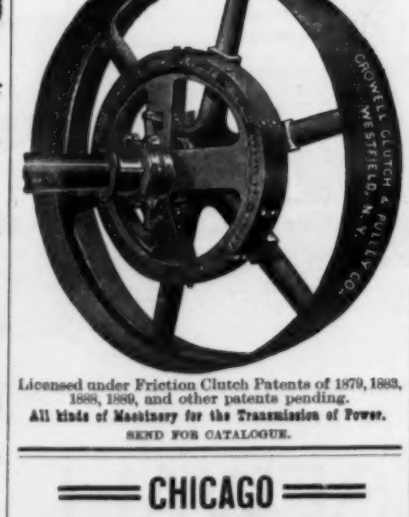

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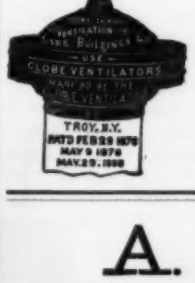

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Apparatus for Recovering Alkali.

The illustrations herewith given show the design of an improved apparatus for effecting the evaporation of alkaline liquors and the calcination of the residue by a continuous process.

The alkaline or other liquid is introduced into the top or upper part of an upright stack, chamber, or flue through which the flames or gases of combustion from a furnace are ascending, so that the liquid thus introduced descends through the stack and during its descent is acted upon by the heat of the gases and its volatile constituents are evaporated. The liquid may be sprinkled or showered into the upper part of the stack; but as this method is attended with the disadvantage that the falling particles of liquid tend to carry down the gases with them, and thereby check or decrease the draft of the furnace, it is preferred to introduce the liquid against the walls of the stack, which confine the ascending stream of gases so that the solution flows down these walls in a liquid film sufficiently thin to be exposed fully to the heat of the gases, so that by the time the liquid reaches the bottom of the stack it is concentrated to a considerable density, being preferably only of sufficient liquidity to insure that it shall continue to flow.

Provision is made further for the evaporation of the liquid by raising it before its introduction into the upper part of the stack to a high temperature, and for this purpose the waste heat radiated from the stack is utilized and at the same time the overheating of the walls and the burning of the alkaline material upon their inner surfaces are prevented by constructing the stack with double walls, forming an annular chamber or jacket between them, into which jacket, at the bottom, the liquid to be treated is introduced and caused to flow upwardly therethrough and to overflow from the top thereof and stream down the inner walls in contact with the ascending gases.

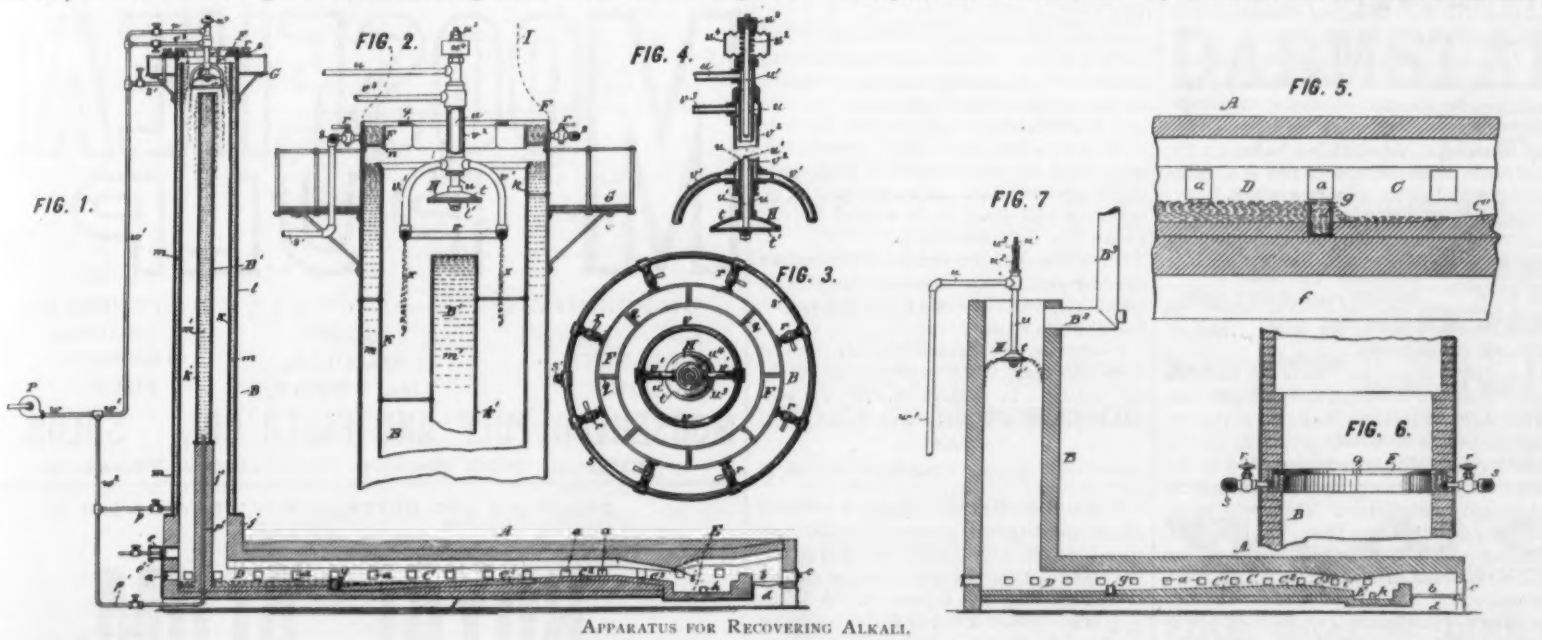
The invention provides, also, for spraying or injecting the liquid to be treated across the ascending stream of gases and against the walls of the stack, so that the liquid shall come in contact with all portions of the ascending gases before the latter escape from the stack and utilize the otherwise waste heat thereof.

The calcining furnace is so constructed that the concentrated liquid on reaching the bottom of the stack is received onto a hearth, where it rests in a bath and flows gradually along the hearth, being further concentrated by the passage of the flames and gases of combustion over its surface, and finally flows over a dam onto the "calcining hearth," properly so called, of the furnace, on which it is stirred and worked by tools inserted through suitable windows or openings in the walls of the furnace.

The hearth is constructed to slope upwardly from the dam and toward the discharge end of the furnace, so that the portions of the material which are still liquid will continually run back toward the dam and separate themselves from those portions which are sufficiently solid to be properly worked or stirred by the tools. The material is gradually moved up the incline and onto a level portion of the hearth or onto a portion which slopes in the opposite direction. On the calcining hearth the material is subjected to the intense heat from the flames which are playing over it, and all ligneous, mucilaginous and other combustible constituents are burned out of it, leaving the purified alkaline or basic material in a fully calcined condition.

In case this apparatus is applied to the manufacture of sodium sulphate the roasting of the salt cake is effected on the calcining hearth, along which it is moved until it reaches the downwardly sloping portion of the hearth, where it is gradually fused by the greater heat of the flames, and it flows into a vat or pit constructed in the masonry, from which the liquefied sodium sulphate may be tapped off and conducted outside of the furnace as desired.

Figure 1 of the drawings represents a vertical mid-section of the furnace in its preferred and complete form. Fig. 2 is an enlarged fragmentary section of the upper part of the stack. Fig. 3 is a plan of the portion of the stack shown in Fig. 2. Fig. 4 is an enlarged detail view of the parts of the injecting nozzle. Fig. 5 is an enlarged fragmentary view of the furnace, showing the dam or bridge wall. Fig. 6 is a fragmentary vertical section showing a portion of the stack in a furnace of modified construction. Fig. 7 is a vertical longitudinal section of another modified construction of furnace.



APPARATUS FOR RECOVERING ALKALI.

THE FURNACE

consists, essentially, of two parts, a horizontal calcining furnace, A, and a vertical stack, B, the two being preferably connected together, so that the stack forms a continuation of the horizontal furnace. The calcining furnace A consists of a long low chamber having a series of doors or openings, *a a*, in its opposite sides and formed with a flat bottom or floor to constitute the calcining hearth C.

The openings *a a* are closed by suitable doors or in any other known way, and are so arranged as to admit of the insertion of stirring bars, hoes, or paddles in order to stir or manipulate the material on the calcining hearth and to move the material along from time to time. The end of the furnace A, which communicates with the stack B, is the receiving end and the opposite end is the discharge end.

At the discharge end the furnace is constructed with a grate or fire bed, *b*, on which the fuel may be burned, with a feeding door, *c*, and an ash pit, *d*, as is usual in furnaces; or in lieu thereof it may be constructed with a nozzle for injecting gas in the manner commonly practiced in the burning of natural gas. Such a nozzle is shown at the opposite end of the furnace, where it is designated by the letter *e*. In either case the flames or gases of combustion from the fuel are caused to flow longitudinally through the horizontal furnace A to the stack B, and they pass close over the calcining hearth. The air to support combustion may be admitted by being drawn through a flue, *f*, extending longitudinally of the furnace beneath the hearth C.

The hearth of the furnace is divided into three or four different portions, of which the first toward the receiving end of the furnace constitutes a shallow vat for holding a bath of liquid under treatment. This portion (letter D) extends from the receiving end beneath the stack to a dam or liquid bridge wall, *g*, which holds the bath of liquid, so that only the portion of the liquid which flows over it can reach the hearth beyond. This dam or bridge wall is made of trough shape, as shown in Fig. 5, so that it shall become filled with the liquid and protected thereby from the destructive influence of the heat.

The second portion of the hearth C, which constitutes the beginning of the "calcining hearth" properly so called, is formed with a rising incline and is designated by the letter C'. At the top of this incline the hearth is preferably extended level for some distance, this portion of the hearth being designated by C_2. The final portion of the hearth (designated by C_3) is formed with a downward incline leading from the level or higher portion and terminating in a receiving vat or pit, E, which is at the discharge end of the furnace. From this vat a tapping off opening, *h*, leads out through the side wall of the furnace in order that fused matter contained in it may be drawn off.

The roof of the furnace is preferably constructed with a downward projection at *i*, in order to direct the flames downwardly, so that they impinge upon the sloping portion C_3 of the hearth, in order that the heat at this portion may be the most intense and sufficient to fuse the matters which are to be received in the vat. The upright portion or

STACK OF THE FURNACE

passes vertically from the receiving end and extends to any suitable height, being constructed in general after the manner of a chimney or smokestack. It is preferably circular in form. Its lower portion (designated by the letter *j*) is built of masonry; but its upper portion is preferably built of sheet iron, steel or other metal (designated by *k*). Outside of this is another sheet iron tube, *l*, so that between the two is formed a liquid space or jacket, *m*. The inner wall *k* of the stack extends uninterruptedly to the height at which it is desired to introduce the liquid to be treated, while the outer wall extends somewhat higher, as shown in Figs. 1 and 2.

The refuse soda from a pulp mill or other liquid to be treated is introduced at the bottom of the jacket *m*, which constitutes a liquid reservoir, by means of a pipe, *p*, controlled by a valve. The liquid ascends through the jacket or reservoir *m* and in so doing absorbs the heat conducted through the inner wall *k* and is thereby raised to a high temperature, while at the same time protecting this wall from injury by the heat from the ascending flames or gases. On arriving at the top of the wall *k* the liquid overflows the latter and streams down its inner surface in a thin liquid film in contact with the ascending hot gases. Being already at a high temperature, its water and other volatilizable constituents are readily vaporized by the heat and carried off with the overflowing gases.

The height at which the liquid is introduced is so proportioned to its volume and the heat of the ascending gases that the liquid is concentrated during its descent to the requisite density and reaches the receiving end of the hearth in a condition as dense as will enable it to flow. The descending film of liquid has little or no effect in retarding the ascending flow of the gases, so that it does not obstruct the draft.

The upper edge of the inner wall, *k*, should be perfectly level, or at a uniform height on all sides in order that the film of overflowing liquid shall be of equal thickness on all sides of the stack. This, however, is practically difficult of accomplishment, and in order to provide means for regulating at will the flow of the liquid at the different sides or portions of the stack there is an independent admission of the liquid, which is under control of an operator stationed at or near the top of the stack, where he may examine or test the flow. To this end an annular trough, F, is set somewhat above the top of the wall, *k*, the inner wall of which trough does not extend so high as the outer wall, so that the liquid introduced into the trough will overflow on the inner wall and flow or drip therefrom or from the downwardly projecting bead, *n*, at the bottom thereof onto the wall, *k*, the upper edge of which is flared outwardly to form a surface for receiving the drip from this bead *n*.

The trough F is subdivided by radial partitions, *q*, into sections, as shown in Fig. 3, each of which is supplied with liquid through an independent valved pipe, *r*, these several pipes leading from an annular pipe, *s*, Fig. 3, which is supplied with the liquid through a pipe, *s'*. When the operator finds that the flow from the reservoir *m* over the top of the inner wall *k* is inadequate on any side, he will, by opening one or more of the valves *r*, admit a sufficient quantity of liquid into the compartment or compartments of the trough F directly above the portion of the inner wall *k*, which is insufficiently supplied with liquid, and thereby cause the liquid supplied to this compartment or compartments to overflow the inner wall of the trough and drip from the bead *n* thereof onto the wall *k*. A circular gallery or balcony, G, is provided in order that the operator may be able to walk around the stack to inspect the flow of the liquid and operate the cocks *r r*.

In order to provide a greater surface for the streaming down of the liquid within the stack than that afforded by the cylindrical outer wall thereof, and in order, also, to utilize the heat in the core or central portion of the ascending stream of gases the stack is constructed with a vertical pillar, B', arranged concentrically within it and extending nearly to its top. The lower portion of this pillar is of masonry, *j'*, while its upper portion is constructed of a tube of iron or steel sheet or plate, *k'*, closed at its bottom to constitute a reservoir (lettered *m'*) for the liquid under treatment. The liquid is admitted to the bottom of this reservoir through a valved pipe, *p'*, and it ascends through the reservoir and overflows at the open top thereof, so that it streams down the exterior surface of the metal tube or wall *k'* and the exterior of the masonry column, *j*, being thereby concentrated in the same manner as the liquid which streams down the wall *k*.

In order to utilize as fully as possible the heat of the ascending gases before their escape from the chimney and stack a thin sheet or film or spray of liquid is thrown radially outward across the ascending stream of gases. For this purpose a spray valve, H, is used, consisting of a fixed disk, *t*, and a movable disk, *t'*, the latter pressed elastically against the disk *t*. The liquid to be sprayed is forced in between these disks under sufficient pressure to cause it to slightly unseat the lower disk and fly out in the form of a film or spray through the narrow space between them. The liquid is supplied to the space between the disks through a pipe, *u*, a rod or screw, *u'*, connected to the disk *t'* passing out through the vertical portion of this pipe and projecting above it, where it receives the pressure of a spring, u^2, adjustable by the nuts u^3.

To prevent leakage or the necessity of passing the rod through a stuffing box this spring may advantageously be housed within an expansible chamber, u^4, the top and bottom heads of which are composed of flexible diaphragms. These features of construction are shown in Fig. 4. In those instances where the draft is sufficiently strong to admit of it provision is made for further utilizing the heat of the ascending gases by causing a spray or rain of liquid to flow through the annular space midway between the walls *k* and *k'*. This spray or rain is indicated at *x* in Fig. 2. It issues from an annular pipe, *v*, preferably on its lower side and connected through branches, *v'*, to a pipe, v^2, arranged concentrically around the pipe *u* and supplied by a pipe, v^3. The pipes *u* and v^3 are supplied with suitable valves to regulate the flow of the liquid through them.

The liquid to be treated is supplied under sufficient pressure to force it to the desired height by means of a pump, P, of any suitable construction, either a centrifugal pump, as shown, or any other type, the discharge pipe *w* of which is divided into two branches, one of which, *w'*, ascends and supplies the pipes *s'*, v^3 and *u*, while the other branch, w^2, descends and supplies the pipes *p* and *p'*.

The admission of the liquid into the stack need not necessarily be at or close to the extreme top thereof, as shown in Fig. 1, but may be at any suitable height. The stack may be continued above the point of admission of the liquid by carrying upward therefrom any suitable known construction of chimney or stack—as, for example, by means of a sheet iron pipe—as shown in dotted lines at I in Fig. 2.

The furnace is preferably constructed with means for supplying fresh hot gases at the base of the stack, in order that if the gases from the fuel introduced at the discharge end of the furnace A have not retained sufficient heat by the time they reached the base of the stack to properly effect the concentration of the descending liquid therein they may be reinforced by introducing fresh gases into the stack. In districts where natural or other gas is available this means will consist of gas injecting nozzles or burners, such as that shown at *e* in Fig. 1, for admitting gas and air at any suitable point at or near the base of the stack, or, in fact, into any part of the stack wherever it may be desired to increase the heat. The burner shown at *e* is a three nozzle burner for injecting natural gas along with air drawn in with it by induction through the tube *e'* in the manner well known in the use of natural gas.

Fig. 6 illustrates a modification. The stack is of masonry and has built into it at any suitable distance below its top an annular trough, F, of the same construction as the trough F shown in Figs. 2 and 3. The liquid is admitted simultaneously to all the different compartments of this trough by opening the valves *r r* thereof, and it overflows the inner wall of the trough and streams thence down the inner surface of the wall of the stack. If the flow is unequal at different sides of the stack it may be equalized by suitably adjusting the valves *r r*.

Fig. 7 illustrates another modification. The stack B is here built of masonry and is supplied with liquid by means of a spray valve, H, of the same construction as that shown in Fig. 4, by which the liquid is thrown in a sheet or spray with sufficient force to cause it to reach the side walls of the stack, to which it clings and down which it flows in a film. The gases of combustion pass from the stack B into a lateral flue, B^2, and up through a secondary stack, B^3, before escaping to the atmosphere.

This furnace is well adapted for use in the manufacture of sodium sulphate from sodium chloride and sulphuric acid. The first stage in the operation—namely, the production of the "salt cake" or acid sodium sulphate—may be accomplished according to any method heretofore followed and the salt cake be placed on the calcining hearth of the furnace A, or a solution of the acid sodium sulphate may be introduced into the bath D. The operation is then the same as in the treatment of an alkaline solution, the material being worked up the inclined portion C' of the hearth and exposed thereon to the heat of the flames playing over it and continually stirred until it is thoroughly roasted and reduced to powder. Instead, then, of being taken out through one of the openings *a*, it is pushed over onto the downward incline C^2, where it receives the most intense heat from the flames, which are directed by the bridge wall directly onto this portion of the hearth, the heat thus acquired being sufficient to fuse the sodium sulphate, which thereupon flows into the vat E, in which it is maintained fused and from which it may be drawn off through the opening *h*.

Mortgages, Etc.

[In the appended list R. signifies a renewal of a pre-existing mortgage; B. S., bill of sale; and Real, a mortgage on real estate.]

EASTERN STATES.

Mortgagor.	*Amount.*
M. O Diettrick, Boston, Mass.	$2,000

WESTERN STATES.

Geo. W. Beermaker (*Record*), National City, Cal.	2,360
Robert B. Cotter, San Francisco, Cal.	5,500
Wm. P. Harrison, San Francisco, Cal. (Real).	35,000
Robert W Neal, San Francisco, Cal. (Real).	3,505
Estate of S. W. Raveley, San Francisco, Cal. (B. S.	5,000
J L. Phelps & Co. (*Independent*), Stockton, Cal. (Real).	5,333
D. W. Osgood (Pueblo Printing Company,) Pueblo, Col. (B. S.)	1,500
Lilla M. Bradbury (Bradbury Brothers), Chicago, Ill. (B. S, half interest)	500
Medearis News Company, Fort Dodge, Ia.	—
Ross & Nye, Axtell, Kan.	560
T. B. Murdock, Eldorado, Kan. (R.)	709
Foley Railway Printing Company, Parsons, Kan.	1,892
H F Anderson, Crystal Falls, Mich.	281
Geo W Pattison, Detroit, Mich.	200
Central West Publishing Company, Minneapolis, Minn. (B. S.)	10,000
John J. Erickson, Minneapolis, Minn.	367
Occident Publishing Company, Minneapolis, Minn.	36,000
R. A Harland, Stockville, Neb.	1,300
Charles Lane, Pendleton, Ore (Real	982
E. A. Thomas (E. A. Thomas & Co.), Spokane, Wash. (Real)	500
E A. Thomas (E. A. Thomas & Co.), Spokane, Wash. (Real)	2,000

SOUTHERN STATES.

Lee Shaw, Cleburne, Tex. (Trust Deed)	—

LIENS DISCHARGED.

W. A. Bushnell et al. (W. A. Bushnell & Co.), San Francisco, Cal.	900
Watson W. Topping et al. (Topping & Pratt), San Francisco, Cal.	900
F. W. Baltes (F. W. Baltes & Co.), Portland, Ore. (Real).	1,000
C. W. Hodson, Portland, Ore. (Real).	2,400

The Coal Combination.

AN INJUNCTION ISSUED—PRICES ADVANCED.

On Thursday afternoon at Trenton, N. J., Chancellor McGill placed on file his opinion in the suit of the Attorney General against the New Jersey Central and the Port Reading railroads. He sustains the State of New Jersey in nearly every point, grants the preliminary injunction asked for, sets aside the leases, commands the Port Reading and Philadelphia and Reading Railroad to desist from controlling the franchise of the Jersey Central Road, and commands the Central to resume control of all of its property and all its corporate duties until a final hearing is heard for the making of the injunction permanent.

The Chancellor believes that the leases are unwarranted by law and that the combination was made to prevent competition in the production and sale of anthracite coal, which is a staple commodity of the State. The opinion is long, containing more than 20,000 words. He states that the object of the information is to have the lease between the Central and Port Reading railroads, and also the tripartite agreement between the Central, Port Reading and Philadelphia and Reading to be decreed void, on the ground of public policy, in that they tend to create a monopoly of the anthracite coal trade by stifling competition. A mandatory decree is sought to enjoin the Port Reading to surrender and return to the Central its corporate franchises, and a restrictive decree which shall perpetually restrain the Port Reading from hereafter intermeddling with such franchises, and restrain the three companies from all future combinations.

This lease, says the Chancellor, cannot be sustained, if legislative sanction for it cannot be found. It is clear that it is claimed that such sanction is obtained in the amendment to the railroad law of 1880. It was contended in the argument by the Attorney General that this act was unconstitutional because of defective title. The Chancellor holds that the act is free of constitutional infirmity in its title and is sufficiently broad in its terms to confer power on railroad corporations chartered by special law. Corporate bodies that engage in public occupation are created by the State on the hypothesis that they will be of public benefit. The Chancellor in discussing the law of 1885, which prohibits the lease of domestic corporations without legislative sanction, and holds that the act is constitutional. It follows, he says, that the lease was made not only without legal sanction, but in defiance of a strictly prohibitory statute. He then takes up the question whether the Attorney General may invoke the power of this court to restrain further operation under the lease. It was well settled that where a corporate excess of power tends to the public injury or to defeat public policy it may be restrained at equity by the Attorney General. There are still peculiar features in the transaction that evince a public danger, much more serious than appears in the mere transfer of corporate duties to a performance by foreign corporations. The parties interested constitute two of the six great anthracite coal carriers through the leasing of the Lehigh Valley; three of them are controlled by the combination. Proofs show that there are localities in the State that formerly had the advantage of competition between these allied roads, but are now subject to the monopoly which this lease affords.

It is true the co-operation of the three remaining coal roads has not been secured. By this lease only one competitor is silenced, and only a little more than one-half of the entire coal region controlled. It is only the second step in the direction of monopoly, the first being the lease of the Lehigh Valley Road. It is to be remembered, however, that the Attorney General may have his injunction when the act complained of tends to do a public injury. He is not required to wait until all the monopoly possible is created, or until all the injury possible is in process of infliction. It is possible, for such a monopoly may be used as the defendant suggests, to introduce economies and cheaper coal, but such a statement does violence to our knowledge of human nature.

The commodity in which these companies deal is a necessary of life in the State of New Jersey. It is the principal fuel of its homes and factories. The slightest increase in its price is felt by a population of hundreds of thousands, for their necessity compels them pay that increase. If once a complete monopoly be established by the destruction of competition, whether by lease or co-operation, the promoters and sharers in it may have whatever price their cupidity suggests. The disaster that will follow cannot be measured.

Chancellor McGill grants an injunction, the bounds of which are defined: "I will therefore continue the present injunction to final hearing, adding to it, however, the further direction that defendants do desist from further performing and carrying into effect the lease and tripartite agreement, and that the Port Reading Company and Philadelphia and Reading Railway do desist from continuing to control the road and franchises of the Central and intermeddling with it; the Central do desist from permitting the Port Reading or Philadelphia and Reading Railroad to use its road; the Central do again resume control of all of its property and all its corporate duties."

President McLeod, of the Philadelphia and Reading Railroad, said that his company had been prepared for just such a contingency.

"I have not yet seen the full text of the Chancellor's decision," he said, "and of course I cannot say much of the details of the matter. I can say, however, that the injunctions will not affect our arrangements in the least. President Maxwell, of the Jersey Central, who is vice-president of the Reading, will simply resume control of his own road, and the old management will be reinstated immediately. There will be no difficulty about doing that, for the road, pending such action as this, has been run under the lease as completely within itself as before.

"None of the business of the road will be affected, and the coal shipments will be made precisely as has been done ever since the leases were signed."

"Will you take the matter into the higher courts?" Mr. McLeod was asked.

"Most assuredly. As soon as it can be done we will take the matter before the Supreme Court of New Jersey. I have no doubt that the leases will be confirmed by the Supreme Court; but, if necessary, we will take the matter to the Court of Errors and Appeals."

The anthracite coal combination moved up prices again on Thursday. President McLeod, of the Philadelphia and Reading Railroad, attended the sales agents' meetings, which were held in the Liberty Building in Liberty street. It was the first time he had been present since the combination was formed.

The Western agents advanced prices to the West 25 cents a ton net, and to Buffalo 30 cents a ton gross.

The Eastern agents made an advance in the price of egg coal of 20 cents a ton, of broken 10 cents, and of chestnut and stove 25 cents a ton. The new quotations take effect on September 1.

The prices for the coming month, the present month and September, 1891, compare in this fashion:

	Aug., 1892.	Sept., 1892.	Sept., 1891.
Broken	$3.90	$4.00	$3.65
Egg	4.20	4.40	4.00
Stove	4.50	4.75	4.35
Chestnut	4.40	4.65	3.90

What the combination has been able to do at the expense of the public can be seen from a comparison of the present rates with those obtaining in January of this year, as set forth in Frederick E. Saward's testimony before the Senate committee. At that time there was much complaint by the companies of overproduction, schedule rates were not maintained, it was alleged, and on January 19 the Lehigh and Wilkesbarre Coal Company made these rates openly: Broken coal, $3.25 a ton; egg, $3.25; stove, $3.50; chestnut, $3.75. It was stated that this was done in order to meet the cutting by other companies.

On January 28 the agents held a meeting at which prices were fixed as follows: Broken, $3.65; egg, $3.75; stove, $3.90; chestnut, $3.40. On April 28 the rates made were: Broken, $3.75; egg, $3.90; stove, $4.15; chestnut, $3.90. The meeting late in June resulted in rates of $3.90, $4.20, $4.50 and $4.40 respectively for the month of July. No change was made for August, but now comes the advance for September, which shows a tremendous increase since the beginning of the year. Explanations of differences in the state of the market and in the season fail to show any good cause for such an increase, especially as it is openly declared that the market conditions and the great stock on hand by no means justify an advance in price just at this time.

Yet at both meetings on Thursday unanimity of opinion in favor of an increase was reported, the discussion turning principally on the amount to be exacted from consumers. The Reading people urged an increase of 50 cents a ton on the higher priced sizes, it is stated, but were overruled. In the case of the cheaper sizes the competition of bituminous coal stood in the way of more of an advance than was made.

On Wednesday the agents of the anthracite carrying roads advanced freights on coal to tidewater 15 cents a ton and to Buffalo 25 cents a ton.

Production for September was fixed at 3,000,000 tons, which was the allowance for August. In September, 1891, the output was 3,333,404 tons.

A Few "Don'ts."

Engineers often in packing a valve or piston rod hammer their packing flat, if it happens to be a little large, so it will go into the gland. This practice cuts the strands of the packing and injures it. A better way is to squeeze it out as flat as desired in a vise. Don't hammer it much. If the jaws of the vise are too short for this work, false jaws of wood or metal can easily be made.

Don't go working around shafting with anything that can possibly catch in the belts, pulleys or couplings. If you wear an apron take it off when at this business, as it is a trap, for if the material does not give way you are liable to go sailing around the shaft, not a very pleasant journey to contemplate. Don't wear a jacket or shirt with ragged sleeves, or in fact any possible projections that could tempt the revolving set screws or key ways. Of course no such things should be around a shaft, the day for that is past, but do not be careless even if there are no such traps around the shop.

Don't leave a pipe that has caught on by a couple of threads only, because it does not happen to leak. Some day it will give way and may result fatally, besides causing much damage.

Don't spring pipes to make them come into position to make connections. A stress is brought upon the threads which, together with the expansion and contraction of the pipe, may cause trouble.

Don't think because there are no signs of trouble that a boiler is all right. Eternal vigilance must be observed. A boiler does not give notice beforehand that something unexpected is going to happen. Don't neglect to watch for possible trouble.

Don't let the water connection to your water column go without blowing out at regular intervals. Water columns have been known to show considerable water when there was very little water in the boiler.

Don't think because the tubes are clean that is all that is needed, and leave the shell covered with soot. Too many engineers neglect to clean the boiler shells. This is the most efficient portion of the heating surface.

Don't leave your furnace doors open for two or three minutes when you fire. Air that enters there does nothing but cool down the boiler, and plenty of it enters, as there is a strong draft and no obstruction. —*Industrial World.*

David J. Corwin, treasurer of the Hub Blank Book and Stationery Company, Boston, Mass., has confessed to setting a fire in the premises occupied by the company on Cornhill on the night of August 15. The company moved in on August 1, and the police say that the stock was overinsured. Corwin told the fire marshal that a sudden and uncontrollable impulse came over him and he set the fire. He is thirty-seven years old, and belongs in Newburgh, N. Y. He was formerly employed in the auditor's office of the New York and New England Railroad, and was at one time chief clerk in the office of the superintendent of the Newburgh and Connecticut Railroad, and was assistant fire chief in Matteawan, near Fishkill Landing, N. Y.

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Imports and Exports.

IMPORTS AT NEW YORK.

FOR THE WEEK ENDED AUGUST 19, 1892.

An. Colors..	589	$36,663	Lead Pencils	6	$607
Alum.....	67	392	Paper.....	985	29,886
Alum's Cake	—	—	Steel Pens..	6	58
Bl. Powders	641	13,456	Stationery..	15	1,308
Soda Ash...	1,892	23,633	Slate Pencils	206	1,804
Soda, Caus..	385	7,553	Clay.....	—	2,295
Soda, Sal....	899	1,600	J'tg B'ts, &c.	—	—
Soda, Hypo.	440	1,094	P. Hangings	7	329
Ultramarine	106	1,790	P'p'rStock..	4,627	55,368
Books.....	—	—	Terra Alba..	—	—
Newspapers	192	7,702	Waste.....	—	—
Engravings.	142	14,043	Wood Pulp.	750	3,896
Printing and Lith. Inks.	8	300	Totals....	12,191	306,847
Writ'g Inks.	138	2,050			

Imports General Merchandise for the week ending August 19, 1892..... $3,893,312

IMPORTS OF PAPER STOCK AT NEW YORK.

FROM JANUARY 1 TO AUGUST 24, 1892.

Whence Imported.	*Rags.*	*Old Papers.*	*Chemical Fibre.*	*Ground Wood.*	*Manilla Stock.*
	Bales.	Bales.	Tons.	Tons.	Bales.
Alexandria ..	510	—	—	—	1,525
Amsterdam..	9	—	—	—	833
Antwerp.....	5,500	137	2,228	2	15,521
Aspinwall ...	850	—	—	—	—
Auckland....	—	—	—	—	735
Barbadoes...	76	—	—	—	—
Bordeaux....	4,200	—	—	—	292
Bremen.....*a*	3,750	—	1,078	—	12,976
Bristol.....	—	—	—	—	3,974
Calcutta.....	—	—	—	—	9,178
Catania.....	773	—	—	—	—
Cent. Amer..	457	—	—	—	—
Copenhagen .	584	—	1,136	—	677
Dublin.	—	198	—	—	269
Dundee	—	—	—	—	6,675
Fiume.....	—	—	50	—	—
Geestemunde	210	—	—	—	251
Gefle	—	—	1,099	—	—
Genoa.....*b*	1,257	—	—	—	4,005
Glasgow	842	198	28	—	635
Gothenburg..	—	—	—	—	710
Hamburg ...*c*	7,014	481	2,070	—	12,151
Havre.....	83	—	—	—	146
Hiogo.....	4,860	—	—	—	—
Hull.....	6,319	—	2,637	—	14,587
Kobé.....	3,510	—	—	—	—
Leith.....	—	62	—	—	57
Leghorn.....	3,030	—	—	—	—
Liverpool...*d*	1,871	151	—	—	24,758
London.....	12,315	2,433	153	—	25,360
Marseilles ...	688	—	—	—	3,187
Nassau.....	—	—	—	—	24
Naples.....	—	—	—	—	9
Newcastle ...	—	91	—	—	3,245
Pillau	2,617	—	—	—	751
Rotterdam...	2,801	—	100	—	8,900
Stettin.....	14,421	—	3,289	—	8,439
Swansea	45	—	—	—	—

a. Including 154 bs. cotton waste.
b. Including 1,189 bs. cotton waste.
c. Including 491 bs. cotton waste.
d. Including 321 bs. cotton waste.

NEW YORK IMPORTS.

FROM AUGUST 17 TO AUGUST 25, 1892.

Paper Stock.

Perkins, Goodwin & Co., Hindoo, Hull, 22 bs. rags, 36 tons chemical fibre.
Perkins, Goodwin & Co., Tauric, Liverpool, 168 bs. bagging.
Hirsch & Schofield, Pennland, Antwerp, 2 tons chemical fibre.
Darmstadt & Scott, State of Nebraska, Glasgow, 36 bs. rags.
G. Rau, by same, 9 bs. rags.
Jessup & Moore Paper Company, Birmania, Genoa, 112 bs. cotton waste.
Standard Export Company, by same, 125 bs. cotton waste.
James Pirnie, Ole Boe, Marseilles, 160 bs. bagging.
Train, Smith & Co., Buffalo, London, 48 bs. waste paper.
Burgass & Co., by same, 54 bs. waste paper.
Atterbury Brothers, by same, 50 bs. rags.
C. P. Sumner & Co., by same, 190 bs. manillas.
G. Rau, by same, 100 bs. bagging.
Augustine Smith & Co., by same, 105 bs. bagging.
Augustine Smith & Co., Greece, London, 413 bs. waste paper.
A. Wertheim & Co., Zanzibar, Hamburg, 59 bs. rags, 41 tons chemical fibre.
F. Salomon & Co., by same, 74 bs. rags, 195 bs. bagging.
Atterbury Brothers, Mississippi, London, 25 tons chemical fibre.
James Pirnie, by same, 207 bs. rags
F. Bertuch & Co., Hekla, Copenhagen, 155 tons chemical fibre.
Horace Dutton & Co., by same, 205 bs. rags.
Train, Smith & Co., by same, 24 bs. rags.
F. Salomon & Co., by same, 110 bs. bagging.
H. T. Maziere, Anna, Gothenburg, 148 bs. bagging.
James Pirnie, by same, 68 bs. bagging.
Charles Harley & Co., City of Para, Central America, 70 bs. rags.
Hugh McInnes, City of Chester, Liverpool, 221 bs. bagging.
J. L. Taylor, Pickhuben, Hamburg, 54 bs. rags.
C. F. Smith, Cedarcroft, Leghorn, 157 bs. rags.
A. Wertheim & Co., Ida, Geestemunde, 210 bs. rags.
E. Hatton & Co., by same, 251 bs. bagging.
James Pirnie, Nomadic, Liverpool, 317 bs. bagging.
J. H. Lyon & Co., Principia, Newcastle, 91 bs. old papers.
G. W. Millar & Co., Principia, Dundee, 19 bs manillas.
E. Hatton & Co., Dania, Hamburg, 20 tons chemical fibre.
Oelrichs & Co., Dresden, Bremen, 15 bs. manillas.

Paper.

Marcus Ward & Co., Majestic, Liverpool, 18 cs.
Nevius & Haviland, by same, 15 cs. hangings.
Louis C. Wagner, Westernland, Antwerp, 12 cs.
E. & H. T. Anthony & Co., by same, 7 cs.
Scovill & Adams Manufacturing Company, by same, 15 cs.
G. Gennert, Zanzibar, Hamburg, 13 cs.
L. De Jonge & Co., by same, 6 cs.
Henry Bainbridge & Co., Manhanset, Bristol, 11 cs.
A. Rollkes & Co., Dania, Hamburg, 3 cs.
D. S. Walton & Co., Pickhuben, Hamburg, 9 bs.
R. F. Downing & Co., by same, 6 bs.
Boorum & Pease Company, by same, 12 cs.
C. A. Haynes, Etruria, Liverpool, 2 cs.
Thorn & Walter, by same, 1 cs. hangings.
Hermann Isaac, La Bretagne, Havre, 11 cs.
United States Photo Company, by same, 3 cs.
Steglich & Baese, Amsterdam, Rotterdam, 4 cs.
F. R. Arnold & Co., Spain, London, 16 cs.

Ink.

Chas. Hellmuth, Munchen, Bremen, 8 cs., $390.
Henry Bainbridge & Co., Greece, London, 115 cs., 7 cks., $1,600.
Same, Spain, London, 16 cks., $450.

BOSTON IMPORTS.

FROM AUGUST 18 TO AUGUST 24, 1892, INCLUSIVE.

Paper, &c.

Wm. Guild & Co., Samaria, Liverpool, 5 bs. periodicals.
Little, Brown & Co., by same, 5 cs. periodicals.
Geo. C. Whitney, by same, 7 cs. card and booklets.
Dennison Manufacturing Company, Georgian, Liverpool, 7 bs. and 1 cs. paper.

Paper Stock.

Train, Smith & Co., Borderer, London, 1,060 bs. rags, 275 bs. waste paper.
S. D. Warren & Co., by same, 550 bs. rags.
Wheelwright Paper Company, by same, 105 bs. waste paper.
Crocker, Burbank & Co., by same, 90 bs. waste paper.
Fairchild Paper Company, by same, 85 bs. rags.
Horace Dutton & Co., by same, 239 bs. rags, 28 bs. and 163 coils manillas.
J. B. Moore & Co., by same, 54 bs. waste paper.
Train, Smith & Co., Georgian, Liverpool, 124 bs. waste paper.
Horace Dutton & Co., by same, 39 bs. and 75 coils manillas.
C. A. Cheney, Ottoman, Liverpool, 229 bs. rags, 44 bs. manillas.
True & McClelland, by same, 272 bs. waste paper.
Horace Dutton & Co., by same, 20 bs. and 33 coils manillas, 52 bs. waste paper.
Warren & Co., by same, 76 bs. rags.

Sizing.

C. A. Cheney, Ottoman, Liverpool, 430 bags.
Thomas Groom & Co., by same, 70 bags.
Baeder, Adamson & Co., by same, 125 bags.

Bleaching Powder.

J. L. & D. S. Riker, Ottoman, Liverpool, 205 cks.
J. L. & D. S. Riker, Georgian, Liverpool, 534 cks.

Caustic Soda.

Mitchell, Woodbury & Co., Georgian, Liverpool, 52 drums.
James Lee & Co., Ottoman, Liverpool, 100 drums.
Wilson, Patterson & Co., by same, 100 drums.

Soda Ash.

Linder & Meyer, Georgian, Liverpool, 15 cks. and 500 bags.
Warren & Co., Ottoman, Liverpool, 135 cks.
Wing & Evans, Samaria, Liverpool, 33 cks. and 280 bags.

PHILADELPHIA IMPORTS.

FOR THE WEEK ENDED AUGUST 20, 1892.

Paper.

A. Hertung & Co., Camrose, Hamburg, 25 cs.
Charles Beck Paper Company, by same, 86 cs.
O. G. Hempstead & Son, by same, 10 cs.

Paper Stock.

Brown Brothers & Co., Michigan, London, 63 bs. waste paper.
Brown Brothers & Co., Missouri, London, 182 bs. waste paper.
Order, Castle Eden, Hamburg, 369 bs. rags, 260 bs. wood fibre.
Drexel & Co., Camrose, Hamburg, 92 bs. rags.

Soda Ash.

Brown Brothers & Co., Indiana, Liverpool, 459 cks.
Brown Brothers & Co., Camrose. Hamburg, 165 cks.

Caustic Soda.

Hill, Sons & Co., Michigan, Liverpool, 150 drums.
Wing & Evans, Indiana, Liverpool, 50 drums.

Alkali.

Order, Missouri, London, 15 pkgs.

EXPORTS of Paper, &c., from New York for the Week Ended August 23, 1892.

BOOKS, cases, to British Australasia, 3; to Liverpool, 17; to Bremen, 7; to Newfoundland, 2; to Argentine Republic, 8; to Amsterdam, 1; to Brazil, 1; to Danish West Indies, 1; to French possessions in Africa, 1; to Colombia, 32; to British West Indies, 5; to Copenhagen, 4; to Cuba, 10; to Constantinople, 4.

PAPER, to Mexico, 332 pkgs.; to British West Indies, 244 pkgs.; to San Domingo, 6 pkgs.; to Hayti, 33 pkgs; to London, 57 pkgs.; to Brazil, 319 pkgs.; to British possessions in Africa, 1 cs.; to Dutch West Indies, 4 pkgs.; to Venezuela, 1 pkg.; to British Honduras, 47 pkgs.; to Cuba, 1,257 pkgs. to Central America, 30 pkgs; to Danish West Indies, 15 pkgs.; to Hull, 4 cs.; to Porto Rico, 504 pkgs., 2 cs.; to Colombia, 76 pkgs., 1 cs.

STATIONERY, cases, to London, 33; to Mexico, 19; to Colombia, 8; to Liverpool, 5; to British West Indies, 6; to Brazil, 19; to Newfoundland 1; to Porto Rico, 9; to Venezuela, 1; to Glasgow, 1; to Hull, 1; to Amsterdam, 1; to British Honduras, 1; to Cuba, 19; to Hayti, 7; to Central America, 9; to Danish West Indies, 1.

AGGREGATES AND VALUES.

Paper, reams.....	—	—
Paper, pkgs.....	2,925	$6,297
Paper, cases.....	10	163
Books, cases.....	88	5,922
Stationery, cases.....	155	10,664
Rosin, bbls.....	2,557	9,400
Totals	5,738	$32,446

Exports General Merchandise for the week ending August 23, 1892..... $6,964,279

BOOKS OF REFERENCE

THE following is a list of Books of Reference on subjects connected with Paper Making, Chemicals, Colors, Machinery, Hydraulics, &c.:

AUERBACH.—Anthracen: Its Constitution, Properties, Manufacture and Derivatives. 8vo..... $5 00
BAIRD.—Standard Wages Computing Tables. Folio..... 5 00
BENSON.—Principles of the Science of Color. 4to..... 7 50
BENSON.—Manual of the Science of Color. 12mo..... 1 00
BESANT.—A Treatise on Hydro-Mechanics. 8vo..... 5 00
BOX.—A Practical Treatise on Heat as Applied to the Useful Arts. Illustrated by fourteen Plates. 12mo..... 5 00
BOX.—A Practical Treatise on Mill Gearing. 12mo..... 3 50
BOX.—Practical Hydraulics. 12mo..... 2 00
BRESSE.—Hydraulic Motors. 8vo..... 2 50
BROWN.—Five Hundred and Seven Mechanical Movements. 12mo..... 1 00
CALVERT.—Dyeing and Calico Printing, including an Account of the Most Recent Improvements in the Manufacture and Use of Aniline Colors. With dyed Patterns. 8vo..... 8 00
CHEVREUL.—The Principles of Harmony and Contrasts of Colors and Their Application to the Arts. Illustrated with Colored Plate. 12mo..... 00
COOPER.—A Treatise on the Use of Belting for the Transmission of Power. 8vo.... 3 50
CORFIELD.—Water and Water Supply. 16mo..... 50
CROOKES.—Handbook of Dyeing and Calico Printing. With dyed Patterns. 8vo... 15 00
CULLEN.—Practical Treatise on the Construction of Horizontal and Vertical Water Wheels. 4to..... 5 00
DOWNING.—The Elements of Practical Hydraulics. 8vo..... 2 75
DUNBAR.—The Practical Paper Maker..... 1 00
FAIRBAIRN.—The Principles of Mechanism and Machinery of Transmission. 12mo.. 2 50

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HOWARD LOCKWOOD. WILLIAM P. HAMILTON.

NEW YORK: SATURDAY, AUGUST 27, 1892.

THE JOURNAL contains the latest and fullest information relative to the paper trade in all parts of the world, including descriptions of new appliances and processes for making paper, experiments with new fibres and other materials, a record of the water supply, with the latest manufacturing news in all parts of the country. It gives the cream of all the foreign technical journals which relate to the paper interest, besides communications from competent persons in the trade, both at home and abroad. The market review and quotations show the state of trade in all the principal cities, and no pains have been spared to make these accurate and complete.

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THE coal combination has advanced the prices of coal at the same time that the combination of the coal carrying roads in New Jersey has been declared invalid by the courts of that State.

THE sympathy or harmony existing among the parties to the combination will not, it is said, be affected by injunctions or legal processes of dissolution. The tie of mutual interest and coal affection will keep up the combination de facto, even if it is squelched de jure.

AN apparatus designed to prevent the formation of spots in paper is described in another column. Its function is to agitate the stuff intermediate of its passage from the screen to the machine.

IN this issue readers of THE JOURNAL will find a description, accompanied by illustration, of a new apparatus for the recovery of soda. This is on a line with an apparatus illustrated two weeks ago.

SUCTION by the medium of a revolving roll is the principle of the apparatus illustrated and described on the first page of this issue of THE JOURNAL. The roll or cylinder is so constructed as to direct the entire force of the exhaust apparatus to that part of its periphery which comes into contact with the wire, the interior of the cylinder being arranged in compartments, which are successively exhausted of air as they bear against the under surface of the latter.

No one expects to find foreign commerce of a great trading nation uniform in volume throughout each month of the year. Special and unavoidable conditions affect both foreign and domestic trade during certain months, and it is therefore unsafe to draw comparisons and deductions covering only a brief period. The Treasury statement, for example, shows a falling off in exports for the month of July, and for some weeks the imports have greatly exceeded the exports. This is not unusual, as many manufacturers in Europe and elsewhere are busy during the winter months making goods for our markets, deliverable during the summer season. For the next three months the export movement will undoubtedly be much heavier, bringing the balance of trade considerably in our favor. This, in fact, has already set in, as last week's exports showed an increase of several millions of dollars as compared with those of the previous week.

A PROCLAMATION imposing a tonnage duty upon Canadian traffic shipped over the Sault Ste. Marie and other American canals has been issued by the President. Even the Canadians themselves are compelled to confess that it is a statesmanlike document, moderate in tone, conservative and opportune. The Canadian Cabinet, which has broken faith with the authorities at Washington, is now face to face with a condition which must be met in a straightforward way. It is satisfactory to see, therefore, that the Canadian press is acting on sober second thought and is now pursuing what may be termed the right track. It may be that the Canadians will give formal notice to abrogate the treaty, and in that case we do not see that there can be any objection on the part of our Government. Treaties are made by nations for mutual objects, and it is perfectly fair for either party to withdraw therefrom on giving the required notice. It is certain that the Government of the United States has nothing to lose by treating Canada fairly, but experience has shown that American ships have been at a disadvantage under present conditions for some time past. What the outcome may be we cannot tell, but the President has clearly shown that in future the treaty rights of American commerce must be respected.

ANOTHER egregious and lamentable blunder has to be recorded against trade unionism in the United States. The switchmen's failure this week at Buffalo, N. Y., would be ludicrous to contemplate were it possible to disassociate in our mind the aggregate money cost to organized labor itself from the almost pitiable surrender of a false position, untenable in the light of equity, law or philosophy. Strikes do not pay the strikers. This truth is not only self evident, but it has passed into a proverb. Valuable time is wasted, lost; never to be recovered by after effort. Sacrifices are made to the suicidal vanity of impolitic and absurdly impulsive men, who, unable to obtain concessions, peremptorily, not to say insolently, demanded, seek to utterly ruin that which they cannot rule. Industry is the only sure pedestal of success. He who is patient and content finally wins in a race with those who are feverish, restless and perversely ambitious. The man who cares to work earnestly day by day, year after year, gets all of the work and at fair wages which he is able to perform well, either manually or mentally. He scorns a fellowship with malcontents and idlers, and spares no precious hours to conspiracy against his own peace and pocketbook. Alas, for the deluded railway laborers who have unwisely switched themselves off from the straight track to happiness!

WHEN the customs administrative act was under discussion in the House of Representatives there were loud complaints on the part of some importers that the special agents of the Treasury would harass them to such an extent as to make the life and business of an importer almost intolerable. Since the law has been in operation, however, those who were most emphatic in its condemnation have had reason to see that its provisions were not of that chaotic order which some of them feared. The customs business, in fact, has been considerably expedited under the law. The Chamber of Commerce, which some time ago appointed a special committee to investigate the complaints against the special agents, made a valuable report on the subject, in which they quoted Secretary of the Treasury Foster as saying that "the inspection of customs business at the several points made at irregular intervals by the special agents is of great value in securing correct, uniform and orderly methods of business, and is indispensably necessary to aid the Secretary in controlling the expenses for collecting the revenue from customs. At such ports as New York, Boston and Philadelphia much of the time of the special agents is occupied in investigating irregular practices in the importation of merchandise under which frauds on the revenue are attempted. For a number of years past the special agents have successfully combated the most skillfully concocted schemes of foreign shippers and their agents in this country, who appear to regard it as justifiable to evade our revenue laws." Mr. Foster remarks further: "I have had sufficient evidence of the results of the work of these officers submitted to me since I entered upon my official duties here to justify the opinion that they are invaluable auxiliaries in the efficient administration of the custom laws. Several of my predecessors have testified their appreciation of the services of these officers by assigning them to important and delicate duties, requiring the exercise of sound discretion, integrity and exceptional ability, and in a number of instances, by reason of the capacity shown, they have been advanced to positions among the most important in this department." It is satisfactory to observe that these men are now receiving that commendation to which they are entitled.

MORE than usual animation has been observable this week among the importers and dealers in foreign and domestic rags, owing to the issuance of the Government's prohibition of foreign rags from infected European districts and to the official announcement that rags from every source must be disinfected before being permitted to land. The order is to go into effect on September 20, and in the meantime shipments will be hurried forward. The disease has made its appearance at Hamburg in unmistakable form, and it is reported that masters of vessels are refusing to accept rags as part of their cargoes, not only from infected but from non-infected ports, on the ground that their vessels are likely to be detained in American waters for an indefinite period. This is quite natural, and may have the effect of advancing freights at certain European ports to a figure which will cause, for a time at least, a total cessation of shipments to this country. This is not a violent supposition, but an admitted probability. It will be interesting to note the actual effect which the prohibition will have upon the paper market. Prices in some grades will be strengthened, but it may be questioned whether they will be appreciably increased.

WE have received a copy of the circular relating to the disinfection of rags issued by the Treasury Department on the 19th inst. This circular, if we are to accept the statements of the customs officials, has not yet been officially communicated to the collectors at the different ports of entry. It reads as follows:

CIRCULAR.

Consular Certificates of Disinfection Required with all Importations of Rags from Foreign Ports—Absolute Prohibition of Rags from Districts known to be Infected with Cholera.

[1892, Department No. 143, Marine Hospital Service.]

TREASURY DEPARTMENT,
Office of the Secretary,
WASHINGTON, D. C., August 19, 1892.

The act approved April 29, 1878, entitled "An act to prevent the introduction of contagious or infectious diseases into the United States," provides that "no vessel coming from any foreign port or country where any contagious or infectious disease exists, nor any vessel conveying infected merchandise, shall enter any port of the United States or pass the boundary line between the United States and any foreign country, except in such manner as may be prescribed by said act."

It having been shown that an epidemic of cholera prevails in Persia, India and Russia, and that it has also reached Germany, Austria and France, and in view of the danger which arises from the importation of rags from cholera infected districts, and of the difficulty, through their reshipment at various ports, of accurately determining the localities in which rags are actually gathered;

Furthermore, because of the prevalence from time to time in various foreign countries of smallpox, scarlet fever, diphtheria and other contagious diseases liable to be conveyed by rags, therefore it is hereby ordered that on and after September 20, 1892, rags from any foreign port will be refused entry into the United States unless said rags are accompanied by a certificate from the consular officer at the port of shipment to the effect that they have been disinfected in accordance with the methods herein described.

It is also ordered that rags gathered in or shipped from any port or place where cholera is known to prevail in epidemic form be denied entry to the United States *absolutely* on and after the date of this circular, except such as were then afloat, which must be disinfected on arrival. All previous department circulars relative to the importation of and disinfection of rags conflicting with the provisions of this circular are hereby amended to conform therewith.

For disinfection one of the following methods will be used:

1. Boiling in water not less than one hour, all rags to be unbaled for this purpose.
2. Exposure to steam not less than one hour, the steam to be of a temperature not less than 100° centigrade (212° Fahrenheit) nor greater than 115° centigrade (239° Fahrenheit).
3. Exposure not less than six hours to sulphurous acid gas, made by burning not less than 3 pounds of roll sulphur to each 1,000 cubic feet of space.
4. Exposure not less than six hours to an atmosphere containing 3 per cent. of sulphurous acid gas liberated from its liquid state (liquid sulphur dioxide).

In methods No. 2, No. 3 and No. 4 the rags must be well scattered upon racks, or so arranged that they can from time to time be turned in such a manner that all shall be exposed to the steam or gas.

O. L. SPAULDING,
Acting Secretary.

It will be observed that, except for rags actually afloat at the date of the order—August 19—imports from alleged infected ports are absolutely barred. This cuts off supplies from Hamburg and other Continental ports of shipment, and, if the report current at the present time of writing shall prove to be true, rags shipped from London, and presumably other English ports, will come under the ban. This would make the situation decidedly more interesting for paper makers and paper stock dealers.

Watermarks.

BY DANDY.

It is seldom that we find such a midsummer spurt as we have witnessed this week in the rag trade, and it was just as was expected; the fun has begun in real earnest.

Is it true that some of the dealers in both domestic and foreign rags actually tumbled over each other on Thursday last to turn over their holdings, some to buy, others to sell? When a man scents more than the usual margin in these days of rivalry it is not surprising to find him in a hurry to clutch it. The sun doesn't shine every day.

Well, gentlemen of the rag trade, I congratulate you and trust that you have made sufficient out of this cholera scare to retire from active labors in first-class health, buoyant spirits and sweet prosperity. "It is an ill wind that blows nobody any good," and if your patience has been rewarded to the extent of a cent a pound or so you deserve it.

Some of my friends seem to think that the scarcity of rags will indirectly help sulphite fibre. Well, it may, but I doubt very much if it will affect prices to the extent of a fraction of a cent.

Rags are a speculative article, it is true, and if the Stock Exchange had to handle them and wood pulp as well the brokers of that institution would soon squeeze a rise out of the latter under the conditions which have prevailed this week, and make a pretty nice haul out of the flurry.

Of one thing I feel certain, and that is that the Government will be slow to remove the prohibition it has just issued against rags from infected territory, and I should not be surprised to see the yule log burning and the snow flakes falling before the edict is cancelled, and I am not a pessimist, either.

I am told that some of the machinery which goes from this port includes some weeks a fair sprinkling of paper mill supplies; but, as the custom house does not classify the machinery, it is impossible to speak definitely as to this.

Trade Talks.

Deputy Collector Berryman, Custom House—We have not yet received the official circular concerning the prohibition of rags, but suppose it will reach us from Washington in a day or two. Our duty under it is clear. We look to the Quarantine officers for the basis for our action, and are guided by them in all that we do in this rag matter. In fact, initiative action lies with them, and we shall carry out the new instructions to the letter.

Atterbury Brothers—The circular issued by the Government has created more excitement this week than anything we have had for some time in our line. Of course we have stopped all shipments, although we have some rags now on the way. However, the instructions are practically prohibitive, because we find that steamers on the other side are refusing to take more rags for American ports, on the very natural ground that they fear complications on this side. It is a somewhat expensive trip for a steamer to arrive here with a cargo of rags and be sent back, and this is precisely what some of the captains of these vessels fear might happen. Of course none of us can tell how long the Government may keep out the rags, especially if the report be true that cholera has made its appearance in London.

Mr. Knight, of John H. Lyon & Co.—Domestic rags are naturally stronger now that the Government has cleared things somewhat and made known its intention to stop European shipments. I think, however, that the shipments afloat will be permitted to land if the cholera does not spread to any alarming extent, but the Government officials will doubtless be very strict in their duties. I think there are plenty of domestic rags, and that while the pulps will be helped somewhat by the scarcity of foreign rags, yet there is no cause for alarm as far as I can see.

Changes, Removals and New Firms.

Lyons & Calkins, publishers of the *Optic*, Imlay City, Mich., have sold that paper.

Stuart & Harber, publishers of the Vernon *News*, Vernon, B. C., have sold out.

The Bloom Publishing Company has been incorporated at Chicago, Ill. Capital, $10,000.

C. A. Noonan, stationer, Blue Earth City, Minn., has been succeeded by George Dean.

The Northwestern Photo Engraving Company, Minneapolis, Minn., has been dissolved.

The Economy Printing Company has been incorporated at San Diego, Cal. The capital is $10,000.

The American Publishing Company has been incorporated at Lawrence, Mass. The capital is $20,000.

The Darling Publishing Company, Detroit, Mich., has been incorporated with a capital of $15,000.

T. G. Whitney, of Kansas City, Mo., has opened a book and stationery store at 106 East Ninth street, that city.

A new corporation at Milwaukee, Wis., is the Commercial Printing and Publishing Company, the capital of which is $12,000.

Barland & Delahanty, publishers of the *Silk Herald*, Paterson, N. J., have been succeeded by the *Silk Herald of America*.

The retail book and stationery business of the Edgar A. Newell Company, Ogdensburg, N. Y., has been sold to Eugene Smith.

The Goodwin Law Book and Publishing Company (Limited), of Toronto, Canada, has been incorporated with a capital of $50,000.

The *Chief* Publishing Company, of Keokuk, Ia., is a new corporation to publish a daily and weekly newspaper. The capital is $10,000.

The Farmers' Publishing Company, to do a general publishing business, has been incorporated at Denver, Col., with a capital of $9,000.

The Bryant Printing Company, East Orange, N. J., capital $100,000, has been incorporated to do publishing and printing in all of its branches.

The Chicago (Ill.) Publication and Lithograph Company is a new corporation to publish and print or buy and sell publications and lithographs.

The Calvert & Allen Printing Company has been incorporated at Seattle, Wash., with a capital of $6,000, to do printing and carry on a bookbindery.

The Albrecht, Cahill & Martin Company, Chicago, Ill., has been incorporated with a capital of $5,000, to do a general printing and publishing business.

Hapeman & Graham, stationers, &c., Ottawa, Ill., have dissolved partnership, Mr. Graham retiring. They have been succeeded by Hapeman & Harden.

The Crown Printing Company, of Denver, Col., recently incorporated, will do a general business in printing, publishing, bookbinding and lithographing.

The *Compass*, a new monthly journal for engineers, surveyors, architects, draughtsmen and students, is published by the Keuffel & Esser Company, New York.

The *Construction Reporter* Company, of Jersey City, N. J., is a new corporation, which has a capital of $100,000 and which will carry on a general publishing business.

The Style Publishing Company, of Louisville, Ky., has been incorporated for publishing and printing purposes. Charles F. Jones is president and manager, and T. W. Green secretary and treasurer; capital

stock, $25,000. The company will publish a literary and fashion paper to be called the *Style*.

The *Budget* Company, Portland, Me., has been incorporated with a capital of $40,000 to publish a weekly journal known as the *Boston Budget*, and other papers or books.

Cannihan, Kirchner & Co. is the style of a new corporation which will do a general business in printing, publishing and kindred lines at Chicago, Ill., with a capital of $20,000.

The William C. Brown Company, San Francisco, Cal., capital $50,000, is a new corporation to carry on the business of publishing, printing, lithographing, bookbinding, &c.

The *Daily Transcript*, Lexington, Ky., has been purchased by James H. Mulligan and E. P. Farrell. Its first appearance under the new management was on Tuesday last, 23d inst.

J. E. Elgin, A. J. Peeler and P. H. Tansey, of San Antonio, Tex., have obtained a charter for the *Texas Land News* and will publish a paper of that name. Their capital stock is $20,000.

The American Playing Card and Printing Company is a new corporation at Chicago, Ill. It will manufacture and sell playing cards and conduct a general printing business. Capital, $1,000.

John A. Briar, formerly with the Burrows Brothers Company, Cleveland, Ohio, and for the last four years with A. C. McClurg & Co., Chicago, has formed a partnership with E.W. Reed to carry on the book and stationery business at Fort Collins, Col.

Failures.

W. H. Morrison, bookseller, &c., 1334 F street, Washington, D. C., has assigned to Fillmore Beall, with preferences amounting to $28,640.

Albert S. Farrand and Alfred E. Everdell, composing the firm of Farrand & Everdell, printers and stationers, 88 Maiden lane, New York, made an assignment on Friday, August 19, without preference, to Lewis Lafrance. Mr. Farrand started the business in 1881, and Mr. Everdell became a partner in 1886.

Henry O. Todd several months ago bought the paper box factories of J. J. Wilkinson, Lincoln Neb. Recently two Eastern paper makers, creditors of Wilkinson, attached the sale, alleging, among other things, that the plant was worth from $8,000 to $12,000. A mortgage on the entire property, executed August 11 and due August 12, from Todd to his brother, William A. Todd, was filed. The consideration named was $4,500. The factory was closed on an attachment by the Graham Paper Company, which had a claim of over $1,100 against H. O. Todd.

Fires.

H. L. Frost, publisher, Kendrick, Idaho, has been burned out.

G. W. Seaman, publisher, Red Mountain, Col., has met with a loss by fire.

The *Gazette* Publishing Company, printer, St. John, N. B., has been burned out. Partly insured.

The *Red Mountain Journal*, Ouray, Col., was burned out on the 14th inst. The loss was $3,000 and was uninsured.

The mill of the Clyde River Paper Company, West Derby, Vt., was burned on August 8. It was insured for $25,000.

A fire broke out in the mill of the Indiana Pulp and Paper Company, Marion, Ind., on August 18. It was extinguished before any considerable damage was done.

A building owned by the Bristol Water Power Company, Bristol, N. H., and occupied as a pulp mill by the Mason-Perkins Paper Company, was damaged by fire on August 14. Loss, $2,000.

On Saturday morning, August 20, an attempt was made to burn down the extensive buildings at West New Brighton, Staten Island, N. Y., owned by M. A. Baldwin-Douglass and used as a wall paper factory. A quantity of kerosene was poured over the weatherboards at the rear of the factory, and the fire was started on the sill. John Hornby, who lives near, discovered the fire about 5 o'clock, before it had got under way, and aroused several neighbors, who extinguished the flames.

Personals.

Major J. J. Riker, of the house of J. L. & D. S. Riker, left on Saturday last for a short trip to Europe.

Lillian Agnes McDermid, daughter of A. McDermid, late superintendent of the Chelsea Paper Company, was married to William Fairbanks, M. D., of Norwich, Conn., on August 20. The wedding tour extends to Niagara and other points. Pleasant wishes and congratulations are extended.

Market Review.

OFFICE OF THE PAPER TRADE JOURNAL,
FRIDAY, August 26, 1892.

THE MONEY MARKET.—The stock market was excited to-day under the decision of Chancellor McGill as to the railway combination. Excitement was high and there was a general decline in the coal combination stocks. Trading otherwise was light and stocks were weak. The money market was firm. Call loans on stock collateral were made at rates averaging from 2@2½ per cent. Rates for time loans are firm at 3 per cent. for thirty days, 3½ per cent. for sixty days, 4 per cent. for ninety days to four months, 5 per cent. for five to six months. Mercantile paper rates are reported by brokers as follows:

	Sixty days.	Four months.
Double named—		
First-class	4 @ 4½	4 @ 4½
Good	4½@ 5	4½@ 5
Single named—		
First-class	4 @ 4½	4 @ 4½
Good	4½@ 5½	4½@ 5½
Not so well known	5½@ 6½	5½@ 6½

The market for sterling was dull and a shade steadier. Continental was fairly active, its tone following sterling closely. Short bills were comparatively scarce. Posted rates are as follows: Sixty days, $4.86¼@4.87½; sight, $4.87¼@4.88.

THE PAPER TRADE.—The mills appear to be working steadily and have a goodly supply of orders. News is fairly active at current prices; Manillas are unchanged; Writings display more activity, and Book papers are in increased demand. City trade is still slow, but orders from interior points are plentiful. The excitement in the rag market has not yet affected the trade to any extent, as the Fine Writing mills are said to be pretty well supplied with rags. They are, however, exhibiting a desire to obtain all the rags there are to be had, and are watching the market with a very natural interest.

JUTE BUTTS.—No spot sales are reported this week. The spot market is nominally 1½c.

WOOD PULP.—The demand for wood pulp has grown more active this week, and it is expected that the rag scarcity will help this market considerably during the next month. At present, however, there is little to report.

WOOD FIBRE.—This market is active, but prices remain unchanged, though a little firmer. Domestic Soda Fibre is quoted at from 3¼@3½c. for Bleached. Domestic Sulphite is moving at 2¾@3½c., as to quality, for Unbleached, and 3½@3¾c. for Bleached. Foreign grades are quoted as follows: Unbleached Pine, soda process, 2.60@3.05c.; Bleached, same process, 3½@3.90c.; Unbleached, sulphite process, 2¼@3½c.; Bleached, do., 3.85@4¼c.; Bleached Straw Pulp, 4@4½c. Imports this week aggregated 299 tons, being 2 tons from Antwerp, 155 tons from Copenhagen, 61 tons from Hamburg, 56 tons from Hull and 25 tons from London.

FOREIGN RAGS AND PAPER STOCK.—This has been an exciting week in the foreign stock market. Yesterday (Friday) the Government issued the expected circular which in effect prohibits absolutely the landing of any rags from infected ports on and after September 20, and also prohibits the importation of rags from non-infected ports on and after the date named, unless accompanied by a certificate of disinfection from a United States consular officer. Cargoes afloat after the date of the circular are to be exempted, provided that they are disinfected on arrival. This edict has completely unsettled the market. On Wednesday and Thursday the demand for rags was exceedingly active. It was known that stocks were light, although the mills have sufficient for present needs. The cholera news, therefore, sent up prices, those who needed rags offering a tempting advance over current rates. Many sales were made, and quite as many importers and dealers refused to sell at offered prices, on the ground that much higher prices would prevail when the present stock was depleted. Some cargoes are on the way, but others have been stopped by cable, as the owners of those to arrive fear that they may have trouble in getting them through Quarantine. The 500 bales in Philadelphia have been placed in store to be disinfected and are not to be removed until cold weather sets in. One house which sent to London for 200 tons received a cable dispatch which read: "Cannot send them; steamers refuse to take rags." News from London that cholera has broken out there has further complicated the situation, as it lessens the chances that any of the rags afloat may be permitted to land. A large quantity of rags now lies at the Atlantic Docks, which the Brooklyn health officers threaten to burn unless the goods are taken away. Domestic dealers are affected by the present situation and are holding many bales for future developments. No. 1 White rags are very scarce, and fine writings and book papers may advance within a month. It is believed that the scarcity of foreign rags will help the market for sulphite fibre, and the importers are already stiffening prices. Imports for the week aggregated 4,077 bales and 299 tons, covering 1,474 bales rags, 299 tons chemical fibre and 1,997 bales manillas. Ports of shipment and quantities were as follows: Antwerp, 2 tons chemical fibre; Bremen, 15 bs. manillas; Central America, 70 bs. rags; Copenhagen, 229 bs. rags, 155 tons chemical fibre, 110 bs. manillas; Dundee, 19 bs. manillas; Geestemunde, 210 bs. rags, 251 bs. manillas; Genoa, 237 bs. rags: Glasgow, 45 bs. rags; Gothenburg, 216 bs. manillas; Hamburg, 187 bs. rags, 91 tons chemical fibre, 195 bs. manillas; Hull, 122 bs. rags, 56 tons chemical fibre; Leghorn, 157 bs. rags; Liverpool, 706 bs. manillas; London, 317 bs. rags, 515 bs. old papers, 25 tons chemical fibre, 325 bs. manillas; Marseilles, 160 bs. manillas; Newcastle, 91 bs. old papers.

DOMESTIC RAGS.—The domestic market is in sympathy with the situation regarding foreign rags, and dealers are holding their stock and showing a disposition to take advantage of the effects of the prohibitive circular just issued by the Government. Some sales have taken place, however, at a shade over present prices.

BAGGING, &c.—There has been a slight increase in the price of bagging, and the market shows some activity. Spot lots are quoted at 1.35c. on No. 1 Gunny, and sales have been made at 1.35c., with higher figures now asked. Mixed Bagging remains about the same, with no advance in price as yet. Imports for the week aggregated 1,997 bales, being 15 bs. from Bremen, 110 bs. from Copenhagen, 19 bs. from Dundee, 251 bs. from Geestemunde, 216 bs. from Gothenburg, 195 bs. from Hamburg, 706 bs. from Liverpool, 325 bs. from London and 160 bs. from Marseilles.

OLD PAPERS.—A little better demand is noticeable and top grades are somewhat active. In other respects nothing special need be noted. We quote: No. 1 Hard White Shavings, 3½@3¾c.; No. 1 Soft White do., strictly free from wood, 2.65@2.75c.; Soft White do., ordinary, 2½c.; Old Ledgers, 2½@2¼c.; Solid Printed Books, 1.50@1.55c.; Mixed Shavings, No. 1, 1.25c.: Mixed Shavings, No. 2, 1@1½c.; Extra No. 1 Manillas, 1.40c.; No. 1 Manillas, ordinary, 1.20c.; No. 2 Manillas, .90@1.05c.; Light Book Stock, 75@80c.; Folded News, 60@70c.; Mixed Papers, 35c.; Commons, 25c.; Bogus Manillas, 60c.; Straw Clippings, 50c.; Binders' do., 50c.

STRAW.—The market is firmer, with no features worth special mention. A moderate business is reported. No. 1 Rye, 60c.; Short Rye, 40@45c.; Oat at 40c.

ROSINS.—Rosins are quiet but steady, with common grades well cleaned up. We quote Common to Good Strained, $1.20@1.25; E, $1.37½; F, $1.42½; G, $1.55@1.60; H, $1.75; I, $2.25@2.30; K, $2.60; M, $3.75; N, $2.90; W. G., $3.10.

CHEMICALS.—Although the market is dull an impression prevails that by next month there will be a better demand all round. The strikes have to some extent interfered with shipments to the West, but regular and prompt transportation is again assured. Stocks of all grades appear to be light. It is reported that the market is quite bare of bleach. Referring to the Liverpool market, under date of August 10, Peter R. McQuie & Son say: "Heavy chemicals are still very dull, but in spite of the usual meagre demand for several articles, particularly Caustic Soda, prices are firmly maintained by the aid of combination and restricted production, so that there is no alteration to report in the current list. There has been a fair demand for Bleaching Powder. Soda Ash is in a peculiar position; orders are being declined, while important plant is kept idle, and this only confirms previous advices. We quote to day: Bleaching Powder, £7 15s. per ton, net cash, for softwood casks, and £7 15s.@8 for hardwood pipes. Soda Ash—Ammonia Alkali, 58 per cent., £6 7s. 6d. per ton in large casks, net cash; Carbonated, 48 per cent., £5 9s. 9d. per ton; 58 per cent., £6 12s. 9d. per ton, net cash. Caustic, 48 per cent., £5 6s. 3d. per ton; 58 per cent., £6 7s. 6d. per ton, net cash. Caustic Soda, nominally £9 2s. 6d. per ton for 60 per cent., £10 5s. for 70 per cent., and £11 5s. for 74 per cent., all net cash; 5s. per ton extra for parcels under 10 tons. Salt Cake (ground and packed in casks), 49s. per ton, net cash. Soda Crystals, £3 7s. 6d.@3 10s. per ton, less 5 per cent. for 3 cwt. barrels." The local market exhibits no special features. During the week there have been sales of 300 cks. Bleach to arrive at 2.15c.; 200 tons Soda Ash at 1.60@1.70c.; 100 tons 58 per cent. Alkali at 1.50@1½c.; 100 drums 74 per cent. Caustic at 3.10@3.20c.; 300 bbls. Natrona Porous Alum at 2½c.; 100 bbls. Keystone Alum at 1¾c.; 5 cases German Ultramarine at 17¾c. Shipments of Caustic Soda from Liverpool to the United States show a falling off as compared with the same month of 1891, those for July last year being 2,481 tons, and for last month 2,481 tons.

CHINA CLAY.—There is a small jobbing demand at unchanged prices of $13@18 a ton, as to quantity, grade and holder.

TWINES.—The situation is unchanged. Quotations are as follows: Cordage—Manilla Rope, half inch, 12¼c.; Sisal Rope, half inch, 11¾c.; New Zealand Rope, half inch, 6¼c.; Jute Rope, half inch, 7c.; Sisal Hay Rope, 8¾c.; Sisal Lath Yarn, fine, 9¼c., and medium, 9¾c.; Jute Lines, 7½c.; Jute Ready, 7c.; New Zealand Hay Rope, 6¼@7¼c.; New Zealand Lath Yarn, fine, 9¼c., medium, 8¾c. Twines—Hemp, 4½ and 6 B Russia, 12c.; 4½ and 6 A American, 12c.; 4½ and 6 D Jute, 9½c.; 4½ and 6 L Jute, 9c.; Hemp Ball, 18 B C, 17c.; 18 C, 15c.; Russian Hemp Hay Rope, 9c.

COAL.—There are no new features in the coal market, Anthracite being about the same as last week. Reports from Philadelphia say that the local demand is about the same, except that there is an improvement among manufacturers who use Pea coal. The Bituminous trade is active, but no change in prices is probable. Boston advices are that as fast as dealers can make room to put in coal they buy a cargo, but that the market is very dull and prices are not quite as firm. The Bituminous market offers no new features. At New York there is still a very quiet condition of affairs, and the fact that coal is in good supply does not tend to make the situation any more hopeful for the near future. In soft coal there is such a variety of the cheaper grades to be had that the whole condition of affairs is affected; in the better qualities there is said to be much delay in loading, owing to the insufficient car service on the roads to tide. At St. Paul the disposition of the trade to defer purchasing hard coal until the programme for September is announced is still the rule. Chicago reports that the intimation that there is to be another advance on September 1 has somewhat stimulated demand from outside points. Several of the agents report a stronger inquiry from the country, but all agree that the Anthracite coal trade is slow for the season. The demand for Bituminous coal is improving, but at present it is slow. There is a better all round inquiry from the country, and some shippers report a large increase in their tonnage over that of last year. Milwaukee advices are that dealers hold off. Western soft coals are gaining a firmer tone, the volume of business is increasing and cars consequently are very scarce. Kansas City reports trade exceedingly dull. Bituminous is holding up well, all things considered, and prices are quoted firm. At Cincinnati the receipts of coal are not of any great volume, and neither dealers nor consumers are taking any great interest in the market conditions. Soft coal is held at higher prices. St. Louis reports that the market can be abundantly supplied for the next thirty or sixty days with the supply en route and in stock. Soft coal is getting in better shape.

EDWIN BUTTERWORTH & CO.,
MANCHESTER ENGLAND,
PACKERS OF ALL KINDS OF
Paper Stock, Cotton Waste and Buffalo Sizing,
Wood Pulp, Moist and Air Dry Pulp,
Soda and Ground Pulp,
(P) 83 GUNNY BAGGING, &c.
OFFICE IN NEW YORK:
Tract House, 150 Nassau St., near Tribune Office,
JAMES PIRNIE, Manager.

WATERBURY
Felts and Jackets,
MANUFACTURED BY
H. WATERBURY & SONS CO.,
ORISKANY, N. Y.
Adapted to *every* grade of paper, from the *finest* to the *coarsest*.
The Largest Manufacturers of Paper Makers' Felts in the World.
Our wet machine or pulp felts are *unequaled for durability*.
For WRITING and LEDGER PAPERS We warrant a felt equal to anything imported.

PRICES CURRENT.

NEW YORK MARKET.

Paper Market.

DEALERS' SELLING PRICES.

Ledger and Record	$0.18 @	$0.24
Flat Caps, superfines	14 @	16
Flat Caps, fines	11½@	13
Flat Caps, engine sized	7½@	9
Blotting, American	8 @	15
Blotting, English	17 @	....
Book, super sized and calendered	6 @	9
Book, super sized and tinted	6 @	7½
Book, extra machine finish	5½@	6
Book, machine finish, low grade	5 @	5½
News, No. 1	4 @	4½
News, rag and wood	3 @	3½
Poster	5 @	7
Hanging, superfine, No. 1	8 @	10
Hanging, superfine, No. 2	6 @	8
Hanging, machine satin	4 @	4½
Hanging, white blank, No. 1	4 @	4½
Hanging, curtain	3½@	4
Hanging, brown	2½@	3
Colored papers, double mediums	6½@	8
Colored papers, glazed medium	7½@	8½
Colored papers, tobacco	8½@	9½
Colored papers, tissues, 20×30, ℔ ream	1.10 @	1.35
Tissues, black, 20×30, ℔ ream	1.40 @	1.50
White tissue, 20×30, ℔ ream	85 @	1.00
White tissue, 24×36, ℔ ream	1.30 @	1.50
Manillas, Flour sack, cream	10½@	12
Manillas, Flour sack, drab	9½@	11
Manillas, Rope, unbleached No. 1	9½@	11
Manillas, Rope, unbleached No. 2	7½@	9
Manillas, No. 1, light weight	6½@	9¼
Manillas, No. 1, heavy weight	6¼@	9½
Manillas, No. 2	5 @	6
Manillas, Bogus	2¾@	3¼
Wrapping Parchment	16 @	20
Tissue Manillas, full count, weight and size, 24×36, other sizes in proportion	75 @	80
Hardware, light colored, No. 1	9 @	10
Hardware, No. 1, glazed, tarred	7 @	8
Hardware, No. 1, glazed	4½@	5
Binders' Boards, ℔ ton, No. 1	70.00 @	90.00
Binders' Boards, ℔ ton, No. 2	40.00 @	50.00
Strawboards, air dried, No. 1, ℔ ton	47.50 @	....
Strawb'ds, steam dried, No. 1, ℔ ton	....@	40.00
Strawb'ds, steam dried, No. 2, ℔ ton	....@	37.50
Straw Wrapping, basis, 15×20, 15½ lbs., 20 sheets—		
36×40, from 38 to 42 lbs. ℔ rm	85 @	....
30×40, from 30 to 34 lbs. ℔ rm	....@	72
24×36, from 24 to 26 lbs. ℔ rm	....@	60
32×36, from 24 to 26 lbs. ℔ rm	56 @	....
30×30, 21 lbs., ℔ rm	....@	44
20×30, from 14 to 17 lbs. ℔ rm	30 @	....
16×24, from 10 to 13 lbs. ℔ rm	26 @	....
18×28	....@	32
15×20, 10 lbs. ℔ rm	....@	22
15×20, from 7 to 8½ lbs. ℔ rm	18 @	....
14×18	....@	16
12×16	....@	14
11×15	....@	12
Straw Wrapping, ℔ lb., heavy weight	1.75 @	1.85
Straw Wrapping, ℔ lb., light weight	2½@	....
Cigarette, Straw Tissue, per case of 100 boxes, 50 books to the box, 200 sheets to the book	21.00 @	30.00
Tea Papers, 16 sheet quires—		
12×18	18 @	20
14×20	22 @	....
Card Middles, ground wood	5½@	6¼
Card Middles, long fibre wood	8½@	9
Card Middles, rag and wood	6 @	9
Pulp Lined Boards, single manilla, No. 100 and heavier	42.50 @	....
Pulp Lined Boards, double manilla, No. 100 and heavier	47.50 @	....

Rags, Rope and Bagging.

White Shirt Cuttings, No. 1	6¼@	6¾
Mill Assorted Whites	5 @	5½
Unbleached Muslins	5½@	5¾
City Whites, No. 1	3½@	....
New Seconds, light	2½@	3
New Seconds, dark	2½@	2¾
No. 2 Whites	1½@	....
Cotton Canvas, No. 1	3½@	....
Linen Canvas, No. 1	.... @	3¼
Country Mixed, free of Woolens	75 @	1
Seconds (City)	90 @	1
Colors, ℔ 100 lbs	.... @	....
Manilla Rope	2.40 @	....
Manilla Rope, tarred	.... @	2
Gunny Bagging, No. 1	.... @	1½
Gunny Bagging, No. 2	1 @	1½
Burlap Bagging, No. 1	.... @	....
Kentucky Hemp Bagging	.... @	....
Tar Shakings	1¼@	1½
Hemp Twine Stock	2¾@	....
Jute Waste	1½@	1¾

Shavings and Old Paper.

White Collar Cuttings	2½@	....
White Envelope Cuttings	3¼@	....
Hard White Shavings, No. 1	3¾@	3¾
Soft White Shavings, strictly free from wood	2.65 @	2.75
Soft White Shavings, ordinary	2½@	....
Mixed Shavings, part white	1.25 @	....
Ledger and Writing	.... @	2¼
Solid Stock	1.00 @	1.65
Book Stock, No. 1 light	75 @	80
Old Newspapers	60 @	70
Imperfections	.... @	....
Manillas, No. 1	1.15 @	1¼
Hardwares, No. 1	½@	....
Bogus Manillas	50 @	60
Mixed Papers	30 @	....
Commons	25 @	....
Binders' Board Cuttings	50 @	....
Strawboard Cuttings	.... @	50

Japanese Rags.

Blues, Hiogo	1¾@	....

Chemicals, Coloring Materials, &c.

Alkali, 48 ℔ cent	1.47½@	1.55
Alum, lump	1.65 @	....
Alum, ground	1.75 @	....
Alum, Keystone	1½@	¼
Alum, Diamond	.... @	2½
Alum, pearl	2½@	2¾
Alum, porous	2½@	2¾
Aluminous Cake	.... @	1½
Anti-Chlorine	.... @	2¾
Bichromate Potash, American	.... @	10
Bleaching Powders, spot and to arr.	2.25 @	2.30
Cambridge Ochre	11.25 @	....
Caustic Soda, 60 ℔ cent	3.10 @	3.30
Clay, China, English, ℔ ton	12.50 @	17.00
Clay, China, "Star"	12.50 @	....
Clay, China, "Keystone"	10.75 @	....
Clay, South Carolina, ℔ ton	9.50 @	10.00
Clay, Terra Alba, French, ℔ ton	1.00 @	1.12½
Clay, Terra Alba, American, No. 1	95 @	1.00
Corn Starch	8 @	8¼
Copperas, American	.... @	80
Extract Logwood	9½@	....
Mineral Pulp	10.25 @	....
Orange Mineral	.... @	9½
Potato Starch	4½@	4¾
Prussian Blue, dry	80 @	85
Prussiate Potash, American	.... @	24½
Rosins, common to good strained, ℔ bbl	1.47½@	1.52½
Rosins, E, ℔ bbl	1.65 @	....
Rosins, F, ℔ bbl	1.70 @	1.75
Rosins, G, ℔ bbl	1.80 @	....
Rosins, H, ℔ bbl	.... @	1.95
Rosins, I, ℔ bbl	2.40 @	....
Rosins, K, ℔ bbl	.... @	2.85
Rosins, M, ℔ bbl	2.95 @	....
Rosins, N, ℔ bbl	.... @	3.05
Rosins, W G, ℔ bbl	.... @	3.20
Sal Soda	1.10 @	....
Soda Ash Caustic, 48 ℔ cent	1.60 @	1.65
Soda Ash, carbonated, 48 ℔ cent	1.57½@	1.70
Soluble Blue	40 @	55
Spanish Brown	½@	1
Sugar Lead, white	12 @	....
Sugar Lead, brown	7 @	....
Sulphate of Alumina	.... @	2½
Sulphuric Acid, 66 ℔ cent	1 @	1¾
Ultramarine, blue	14 @	17¾
Venetian Red	1 @	1½
Vitriol, blue	5½@	5¾
Yellow Ochre Rochelle	1.35 @	1.50

BOSTON MARKET.

Chemicals.

Alkali	1.42½@	1.47½
Aluminous Cake, currency	1¾@	1¾
Alum, American ground	2 @	2¼
Alum, American lump	1¾@	2
Anti-Chlorine	3 @	3¼
Bichromate Potash, American	10½@	....
Bleaching Powders	2.30 @	2½
Blackley Blue	2.00 @	3.00
Caustic Soda, 70 ℔ cent. (for 60 ℔ cent.)	2.95 @	3.10
Clay, English, ℔ ton	14.00 @	18.00
Clay, American, ℔ ton	13.00 @	14.00
Copperas, ℔ lb	2½@	1
Extract Logwood	5½@	6½
Lime, Lockland, ℔ bbl	95 @	1.00
Prussian Blue, ℔ lb	50 @	60
Prussiate Potash, American, yellow	.... @	18½
Prussiate Potash, red	51 @	52
Rosin, common strained, ℔ bbl	.... @	....
Rosin, E	.... @	1.45
Rosin, F	1.50 @	....
Rosin, G	.... @	1.55
Rosin, extra pale	.... @	....
Sal Soda, English, ℔ lb	1.07½@	1.10
Soda Ash, 48 ℔ cent. caustic	1¾@	2
Soda Ash, 48 ℔ cent. carbonated	.... @	....
Soluble Blue	55 @	65
Sugar Lead, white	12½@	13
Sugar Lead, brown	7½@	8½
Sulphuric Acid, 60°	1½@	1¾
Terra Alba, ℔ ton	15.00 @	20.00
Ultramarine, ℔ lb	12½@	16
Venetian Red, ℔ lb	1¾@	1¾
Vitriol, Blue	5½@	5¾
Yellow Ochre	½@	1

Wants and For Sale.

Twenty-five cents per line of eight words each insertion. No charge less than one dollar.

WANTED—AN EXPERIENCED ENGINEER on manilla tissue; must be a man with family. Address AUGUST,
Care Paper Trade Journal.

SITUATION WANTED BY A MARRIED MAN; temperate habits; can run Fourdrinier or cylinder machine, on all kinds of stock; experience given if wanted. Address A. C., care Journal.

WANTED—A THOROUGHLY PRACTICAL paper maker with large experience would like to correspond with parties in want of a superintendent; best of references. SEPT, care Journal.

WANTED—SITUATION AS MILLWRIGHT; had twenty years' experience in a blotting mill; understands treatment of blotting stock. Address G. C. ANDERSON, Manchester, Va.

WANTED—SALESMAN OF EXPERIENCE to travel for a well-known house in the paper trade; references required. Send answer, stating salary desired, to EMPLOYER, care Paper Trade Journal.

WANTED—A FIRST-CLASS FINISHER OF fine tissue paper, trimmed all around, on Cranston cutting press.
Box 348, Lee, Mass.

WANTED—A FIRST-CLASS MACHINE tender on wood pulp board, for a mill near Chicago; good position to the right man; state experience and where last employed. Address ROYAL, care the Journal.

WANTED—TWO FIRST-CLASS MACHINE tenders for Pacific Coast; must have experience in fast running on news and manilla. Address PACIFIC, care Paper Trade Journal.

TO PAPER MANUFACTURERS—A PRACtical paper maker, experienced in the manufacture of most classes of paper and using all sorts of fibres, is open to engage at once as superintendent or foreman in small or large mill; used to large outputs and quick speeds. Replies to X. Y. Z., care Paper Trade Journal.

WANTED.

To rent or purchase straw wrapping mill in the West; cheap rye straw and coal. Address SUCCESSFUL PAPER MANUFACTURER, care Paper Trade Journal.

WANTED.

Foreman, beaterman, machine tenders, calender men and finishers; what kind of stock and machine used to; with references.
BUCKEYE SUPPLY CO.,
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FOR SALE—TWO STEAM ENGINES, TWO beaters, two Jordans, in good condition; one Pusey & Jones 68 inch Harper Fourdrinier, as good as new. Box 25, Short Hills, N. J.

FOR SALE—ONE SET OF NINE KNIGHT'S dryers, 14 inch diameter, 68 inch face, in complete running order, at a bargain. Address C. M. ROBERTSON ESTATE, Montville, Conn.

A VALUABLE BINDERS' BOARD MILL FOR SALE.

To settle an estate, the undersigned offers a good paying mill and farm at private sale; can be sold together or separately. This mill is in excellent condition and has orders for entire product; railroad at door. Address
S. A. HARLAN, Childs, Md.

Steam and Power Pumps For Sale.

One Woodward steam pump, cylinders 14 in. and 7 in., 3 in. suction and discharge.
One 6 x 4 x 6 Worthington steam pump.
One No. 3 Niagara steam pump, 2½ in. suction and 1¼ in. discharge.
One each Nos. 2 and 3 Earl steam pump.
Two 6 in. C rliss geared boiler feed pumps, 2½ in. suction and discharge.
Write for prices to D. B. CRUICKSHANK, 248 Dyer street, Providence, R. I.

FOR SALE.

One Dryer, 36x76 inches.
Three Dryers, 36x84 inches.
Four Dryers, 28x72 inches.
Five Chilled Calenders, 6x62 inches.
BLACK & CLAWSON CO.,
Hamilton, Ohio.

FOR SALE.

Seven 62 × 28 inch dryers, frames, rolls, &c., complete. One stack 9 chilled rolls, 68 inch face, made by Farrell Foundry and Machine Co. One 3 inch brass centrifugal pump with iron frame. Five 12 × 62 inch gun metal press rolls. Two Coucher and one Breast copper rolls. One new and one second-hand 25 horse power steam engines. One new 80 inch revolving cone cutter. Also builders of paper machinery from improved patterns. CLARK & SPENCER,
Lee, Mass.

NOTICE.

My attention having been called to the fact that certain parties are infringing certain Letters Patent granted to me, to wit: No. 212,866, dated March 4, 1879, covering a new form of carpet lining, and No. 235,698, dated December 21, 1880, covering the method of and apparatus for making the same, this is to notify all such persons, whether manufacturers or dealers, that any infringement of either of said patents will be prosecuted to the full extent of the law. MOSES NEWTON, Patentee.

CHICAGO, MILWAUKEE AND ST. PAUL RAILWAY CO.
GENERAL OFFICES:
100-172 ADAMS ST., CHICAGO.
INDUSTRIAL DEPARTMENT.

TO PAPER MAKERS.

The Chicago, Milwaukee and St. Paul Railway has on its lines exceptionally advantageous locations for the manufacture of paper, especially news paper, the demand for which is constantly increasing.

In view of the wonderful development of the West it will be readily discerned that paper mills now locating in Wisconsin and elsewhere will be able to command the Western trade on account of the advantages of proximity to market and raw material, central location and transportation facilities. Pine and Poplar exist on the line in immense quantities, and considerable Spruce can also be obtained. Wood pulp mills and paper mills are being established at many points.

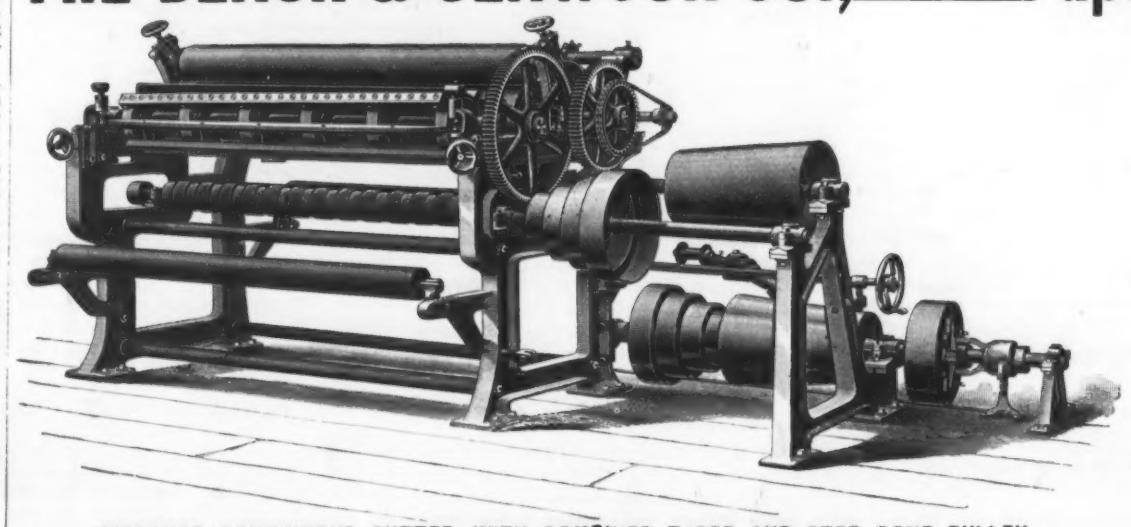
In the process of manufacture of wood pulp for news and other paper such progress has recently been made that the older machinery in Eastern mills is now at a disadvantage.

Waters Powers on the line are numerous. At Centralia, Wis. (Wisconsin River), there is a great water power (estimated for tailrace 5,700 H. P. at low water and at average water for the year 12,578 H. P.) Kilbourn City, Wis. (Wisconsin River), has a 6,000 H. P. water power. (Wisconsin River water is eminently suited for the manufacture of fine writing paper.) De Pere, Wis. (Fox River), has 2,800 H. P. to spare. At other points along the Fox River 90,000 H. P. can still be utilized. Several other places on the line have water power and facilities for obtaining wood.

300,000 tons of flax straw tributary to our Western lines are burned up annually; this product should ultimately supplant imported rags in the manufacturer of fine linen paper.

Paper Makers contemplating the erection of new mills in the West, and others seeking particulars relative to industrial advantages on the line, are invited to address
LUIS JACKSON,
Industrial Commissioner,
C., M. & St. P. R'y, 160 Adams St., Chicago, Ill.

THE BLACK & CLAWSON CO., MANUFACTURERS OF Paper Mill Machinery,



IMPROVED CONTINUOUS CUTTER, WITH COMBINED TAPER AND STEP CONE PULLEY.

FOURDRINIER,
HARPER IMPROVED FOURDRINIER
AND CYLINDER MACHINERY.

JORDAN ENGINES.

Jordan Engines Refilled.

Screens, Calenders, Rag Cutters, Cylinder Molds, Deckel Straps, Paper Cutters, Screen Plates, Dandy Rolls, Stuff Box Trucks, Iron and Brass Castings.

REVOLVING REELS AND STACK REELS.

FOR PARTICULARS ADDRESS

THE BLACK & CLAWSON CO.,
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One 72 in. Fourdrinier machine, 12 iron dryers, 2 stacks chilled rolls. Gould screen.
One 64 in. Aerophor dampener (new).
One Ross straw cutter (new).
One hand power baling press, cheap.
One 18x48 in. Corliss, and one 16x36 in. Harris-Corliss steam engines.
One 44 in. self clamping power cutter.
One 110 in. slitter and rewinder, new; will slit tissue.
One 16x36 in., one 11x24 in. Putnam automatic engines.
One 1,000 lb., one 800 lb., four 500 lb. beaters.
One Marshall engine, newly filled.
One Jordan engine, newly filled.
All sizes centrifugal pumps.
Three first-class rag cutters.
Two ventilator fans.
Water wheels, various sizes and makes.
One new Loring rotary, 7x20; one first-class Loring rotary, 6x22.
Shafting, Reeves wood pulleys, hangers.
Send for catalogue.
F. H. DAVIS & CO.,
Exchange Building, BOSTON.

E. F. WIECKERT

25 Water St.,
NEENAH, WIS.,
MANUFACTURER OF
COGS
AND ALL KINDS OF
MILL WORK.

You will save money if you have no cog pattern by drawing a cog out of a wheel, marking the exact width on the face cut and the exact thickness on the end cuts of this diagram and sending to me. If you want one key seat only, mark off one when you send card for pattern. I carry a complete stock of seasoned Hard Maple and can make Cogs on short notice. When you write for price give width and thickness of larger end. Write for pattern cards.

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Paper and Pulp Mill Contractor and Builder.

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THE F. GRAY CO.,

PIQUA and AKRON, OHIO,

Principal Office, PIQUA,

MANUFACTURERS OF

Fourdrinier, Harper and Cylinder

FELTS.

Press Felts and Jackets for all kinds of Paper.

TRY OUR HARPER FELTS. THEY ARE THE BEST MADE FOR ALL GRADES OF PAPER.

WANTED!

MANUFACTURERS TO

Send us Samples of their Stock

OF PAPER ON HAND,

WITH BOTTOM TEN DAY CASH PRICES.

We buy large lots and sell all grades of

Paper, Rags and Paper Stock.

We trade Stock or Cash for Paper.

BULKLEY, WARD & CO.

14 and 16 So. 7th Street,

PHILADELPHIA, PA.

We have dropped the "Gilbertson's Old Method" brand of roofing plates, therefore we now WITHDRAW our GUARANTEE from same.

OUR REASONS ARE AS PLAIN AS A B C.

A We could not act in good faith with our customers had we accepted the propositions made to us by the maker with a view to equalize the increased cost, brought about by the advanced duty.

B Numerous complaints and letters received by us from our customers positively assert that the quality of this brand is not now what it used to be.

C After careful investigations we find we can make a much *better* and a *heavier* and more *evenly coated* plate *in our own works* in Philadelphia than we have ever imported.

Hence, our heaviest coated, guaranteed Roofing Plate will now be the "MERCHANT'S OLD METHOD," made and guaranteed by

Yours respectfully,
MERCHANT & CO.,
NEW YORK. CHICAGO. LONDON.
Philadelphia, July 6, 1892.

WOOLWORTH & GRAHAM,

COMMISSION

Paper Warehouse.

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OFFICE, 440 Pearl St. | WAREHOUSE, 38 Rose St.,
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JUTE AND LINEN Paper Stock.

J. & W. SMITH,

DUNDEE, Scotland,

Packers and Shippers of

Clean Jute Threads, Clean Jute Ropes, Gunny Bagging, Manilla Ropes, Bleached Linen Cuttings and Bleached Linen Threads.

ENGINE CLEANING WASTES,
Colored Jute Wastes, Bleached Jute Wastes
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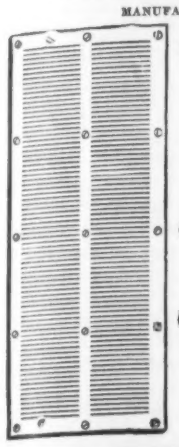

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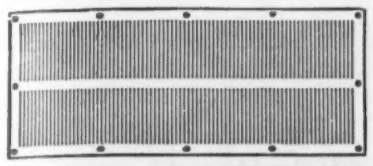

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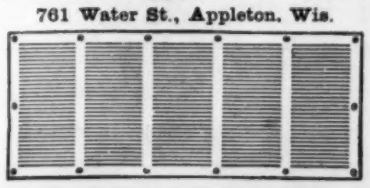

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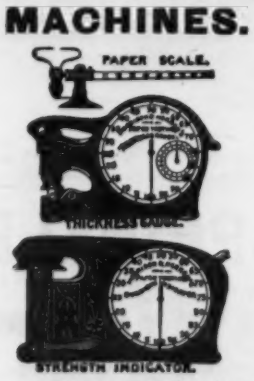

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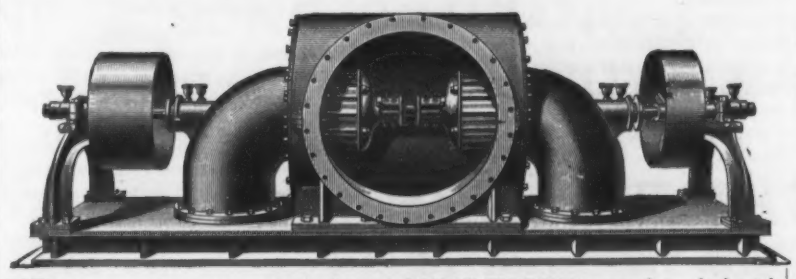

THE above engraving represents a pair of 12 inch **VICTOR TURBINES** arranged on a horizontal shaft, with Cast Iron Flume, Draft Tubes, End Bearings for Shaft, and Driving Pulleys complete, all mounted upon a substantial cast iron bed plate. The entire arrangement is very complete and strictly first class in every particular. We are now prepared to furnish Victor Turbines either single or in pairs on horizontal shafts and where the situation admits of their use we recommend them.

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Possesses more than Double the Capacity of ordinary Water Wheels of same Diameter, and has produced the Best Results on Record, as shown in the following tests at Holyoke Testing Flume:

SIZE WHEEL.	HEAD IN FEET.	HORSE POWER.	PER CENT. OF USEFUL EFFECT
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17½ inch.	17.96	36.35	.8930
20 inch.	18.21	49.00	.8532
25 inch.	17.90	68.62	.8584
30 inch.	11.65	52.54	.8676
35 inch.	17.29	133.19	.8497
40 inch.	16.49	148.93	.8253
48 inch.	15.51	179.29	.8202

Such results, together with its nicely working gate and simple, strong and durable construction, should favorably commend it to the attention of all discriminating purchasers.

THESE WHEELS ARE OF VERY SUPERIOR WORKMANSHIP AND FINISH.

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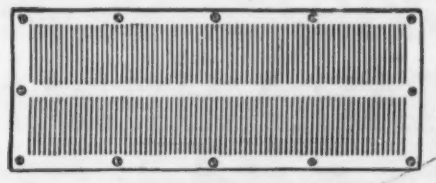

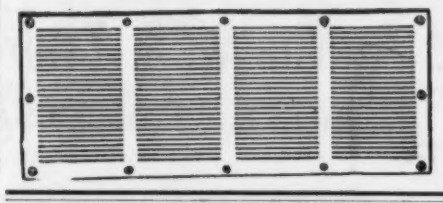

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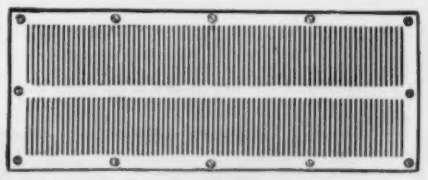

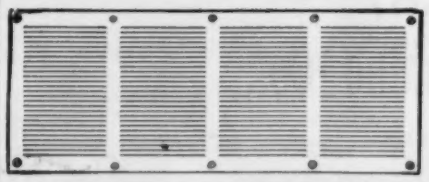

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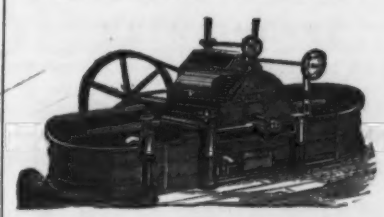

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EASIEST RUNNING. STRONGEST MADE.

Over Four Hundred in use by the Leading Paper Mills of the United States, Canada and Mexico.

THE CELEBRATED HOLYOKE ROTARY BLEACH BOILER.

We also manufacture all kinds of STEAM BOILERS, Barlow Kiers, Penstocks, Wheel Cases, Stand Pipes, Tanks, Castings, Smoke Stacks, Grate Bars, Boiler Fittings. All Work Warranted.

Located in Holyoke, "the Paper City," for over thirty years, we have made a specialty of Plate Iron products for use in paper mills. We cheerfully quote prices.

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Sole Manufacturers of the "UNDERCUT" Paper Cutting Machine.

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THE EVANS FRICTION CONES

Are running thirty-seven of the best paper machines in this country transmitting from 20 to 40 horse power each. Hundreds of small cones, hanging and standing, in operation, driving all kinds of machinery. Send for Catalogue "G."

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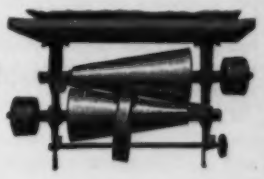

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AWARDED THE GRAND PRIZE AT LATE PARIS EXPOSITION.

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Pulp and Paper Mills.

DODGE WOOD SPLIT PULLEYS, PATENT SPLIT FRICTION CLUTCHES, AMERICAN SYSTEM OF ROPE TRANSMISSION, PATENT CHAIN OILING JOURNAL BEARINGS, ETC.

RICE MACHINERY CO.,

ENGINEERS AND MACHINISTS,

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New Catalogue Ready.

Manufacturing News.

EASTERN STATES.

The Eagle Paper Mill, Putney, Vt., has shut down for repairs.

Keeney Brothers, Manchester, Conn., have again started up their paper mill, which had been shut down for ten days to make repairs.

F. H. Whittelsey's new mill at Windsor Locks, Conn., is well under way. The machinery is to be set up as fast as the floors are laid.

Four more large digesters have been ordered for the fibre mill of the Howland Falls Pulp Company, Howland, Me.

The new plant for manufacturing soda ash and bleaching powder located at Rumford Falls, Me., is expected to be in running order by October.

The Berlin Iron Bridge Company, of East Berlin, Conn., will design and build the new buildings for the New Orleans and Carrollton Railroad Company at New Orleans, La. The power house is 83 feet wide by 130 feet long, with brick walls and an iron roof. The car shed will be built entirely of iron, 130 feet wide by 140 feet long. It is the intention of the New Orleans and Carrollton Railroad Company to have the finest electric railroad plant in the Southern States.

Capitalists of Bangor, Me., and vicinity are negotiating for the purchase of a valuable mill site at Upper Stillwater, on which to erect a large pulp mill.

MIDDLE STATES.

The Pusey & Jones Company, Wilmington, Del., is meeting with a gratifying demand for its Gould screen. In addition to the orders received from domestic mills the company has received orders for five screens to go abroad, two to England, two to Sweden and one to Denmark. This is only another proof of foreign appreciation of first-class American machinery.

At a public sale on August 20 of the Fowlerville (N. Y.) Pulp and Paper Mill the mill was bid in by G. H. P. Gould for $36,000, and the Port Leyden Pulp and Paper Company's mill was sold to the same person for $14,025.

The Victoria Paper Mills Company, Fulton, N. Y., is putting in a new Root's improved sectional tube boiler.

A paper box factory is to be built at Brownville, N. Y.

The High Falls (N. Y.) Sulphite Pulp and Mining Company is now fully organized. Its officers have been very busy securing necessary lands, water power and river rights, title to pyrites mines, perfecting arrangements, &c.

The Herkimer Paper Company, Herkimer, N. Y., is building a chimney which is to be 180 feet high.

The Penn Street Mill of the Reading Paper Company, Reading, Pa., was obliged to shut down for several days recently by reason of the large fly wheel becoming loose. The wheel is 24 feet in diameter and weighs 27 tons.

T. T. Pool has most of the machinery for his mill at Solebury, Pa., on the ground and machinists are setting it up.

Cranston & Jones, New York, are now building a down cutting paper cutter, which they have named the "Overcut," to distinguish it from their well-known "Undercut." For years they have been adapting the "Undercut" to certain kinds of work, and at the same time have made a careful study, and recorded the results, of the requirements for a paper cutter for a different class of work. The "Overcut" is said to embody these requirements and to be a strong, serviceable machine, which will last. The firm has put on it its patent gauge and index wheel and triplicate gauges, which, with its other improvements, are said to make it the most rapid cutter in the market. Several orders for this machine were sent in before the firm had even built one. All of the cutters made by this firm have lines cut in the tables every inch all the way across, as well as scales of fractions of an inch. The "Overcut" will cut 6 inches thickness of paper. It is compact and all gears are thoroughly protected. It has the same patent friction clutch which has given satisfaction for years on the "Undercut." The knife is operated by connecting rods attached to each end of the knife bar. These connecting rods are easily adjusted; in fact, any part of the machine can be readily adjusted, but to accomplish this advantage it has not been necessary to complicate the machine in any way.

WESTERN STATES.

There has been considerable controversy about the ability of Americans to make tin plate successfully, but some of the large manufacturers do not seem afraid to invest in its productions. The American Tin Plate Company, of Elwood, Ind., of which Col. A. L. Conger, the successful manufacturer, of Akron, Ohio, is president, is now turning out 1,200 boxes of tin plate per week. The Falcon Iron and Nail Company, of Niles, Ohio, has contracted for the machinery for a similar plant and has begun work on its buildings. The power required for each of these mills is about 1,000 horse power and is furnished in both cases by Porter-Hamilton engines built by William Tod & Co., of Youngstown, Ohio.

The mill of the Anderson Paper Company, Anderson, Ind., will be doubled in capacity. The main building will be extended 150 feet and the boiler house will be doubled in size.

The Hawkeye Paper Mill Company, Tama, Ia., has completed its building and is now setting up the machinery. It hopes to start up by November 1.

The Evansville Paper Mill, Evansville, Ind., Ferdinand Funke proprietor, having undergone some needed repairs and the addition of a new 75 horse power engine, a stack of calenders, driving train, &c., is now running full time on light rag paper, in 9 inch rolls, of which this mill makes a specialty. Under the efficient management of Ferdinand Funke's son, the genial Capt. John M. Funke, the output of the mill has been greatly increased. Mr. Funke, Sr., sailed for Europe on July 7, where he will remain four months, and during his visit to Germany will view the pulp mills of Prince Bismarck.

The Black & Clawson Company, Hamilton, Ohio, shipped on August 15 twelve carloads of machinery, comprising the new machine for the Wisconsin River Paper and Pulp Company, Shrevesport, Wis.

The wall paper factory at Kaukauna, Wis., is now running four machines, producing 20,000 rolls per day. Two more machines are to be put in and the product will be increased to over 30,000 rolls.

A paper mill is to be built at Topeka, Kan., and the plant is to be taken from a mill in Georgia which is to be dismantled.

It is reported that it is proposed to utilize the water power at the Morgan Paper Mill (burned), just east of Battle Creek, Mich., the Heaning power at Wheatfield and that at Ceresco. The scheme is to put electric dynamos at each of the powers mentioned and wire the electricity into Battle Creek for the use of consumers of light power.

Improvements which have been in progress at the mill of the Jackson Pulp Company, Jackson, Mich., are nearly completed, and it is expected that the mill will start up by September 1. One of the most noticeable improvements at the mill is the new storehouse, a two story brick structure, 50x60 feet, the lower story of which is used for storage purposes and the upper for offices and machine shop. The mill has its own electric light plant, run by its own power. In one of the buildings is a new furnace fitted with a patent fire grate, of which Mr. Cornwell is the inventor.

SOUTHERN STATES.

Luke Brothers have purchased land at Davis, W. Va., on which they will erect a large paper and pulp mill.

Ground has been broken for a new steam power paper mill on the main stem of the Baltimore and Ohio Railroad, just outside of Ellicott City, Md. It will be built and operated by William L. Nott, on whose property the works will be situated, and Mentzel & Sons, the well-known paper dealers, of Baltimore. The site, both as regards water supply and shipping advantages, is said to possess every requisite for the business. Mentzel & Sons have been operating, for a number of years, the commodious mills at Oella, Baltimore County. It is expected to have the new mill in readiness by the middle of the coming winter.

Accidents.

Joseph Bird, employed at the Logansport Paper Mill, Logansport, Ind., had his left foot severely scalded in a vat of boiling liquor recently.

L. M. Culver, employed at the South Bend Paper Mill, South Bend, Ind., fell from a scaffold while at work about some machinery on August 17, and received severe bruises to his back and lower limbs, although no bones were broken.

Newton J. Martin, an employee in Charles A. Clark's South Side Paper Mills, Logansport, Ind., was painfully scalded on August 18, while on duty. He was attempting to remedy a leak in one of the pipes, when an open valve permitted a large quantity of the boiling lime water to pour out upon his shoulders and back.

Joseph La Montague, an employee of the Fall Mountain Paper Company, Bellows Falls, Vt., was instantly killed while drawing logs up the chute on August 16. His head was struck by one of the logs and his skull crushed. He was a young man of twenty-four or twenty-five years, whose home was in Canada, where his body was taken.

A Strike at Holyoke.

The machine tenders at the Chemical Paper Mill, Holyoke, Mass., struck on Wednesday.

On Thursday the men were got together by one or two leaders and a consultation was held. As a result Superintendent James Phillips was asked to increase the wages of the men from $1.35 to $1.50 a day.

Mr. Phillips said that he would see Mr. Newton about it, and the men went back to work.

Mr. Newton told Mr. Phillips that he could not see his way clear to granting the increase. In fact, he had been making some effort to keep the machines all going, just to give the men work. He thought in a few weeks, when the busy season opens, he could give the increase.

When Mr. Phillips told the men what Mr. Newton had said they were called together by their leaders and the strike was ordered.

The company says that the men will have to return to work at the old rates. It is also said that the machines, of which there are five, will not be stopped by the strike. Two of the machines will be stopped, however. They need repairs very badly, and the timbers were ordered to-day for a new flooring.

The strike appears to be outside of the union.

General Notes.

M. A. Swift & Son, paper dealers, Boston, Mass., have extended their facilities by leasing the premises No. 15 Exchange street, that city.

Levi L. Putzell, formerly traveling for a Chicago paper house, was recently arrested at Crete, Neb., charged with defalcation in the sum of $1,500.

The system adopted by Professor Thurston, of the Cornell University, of lining the interior of steam cylinders with non-conducting material to prevent thermal loss between steam and metal of the cylinder is well known. Experiments have recently been made by Mr. Bandsept, of Brussels, says *Industries*, with a view of obtaining a more efficacious method of forming the lining of the cylinder. By this system steam at a higher pressure than that usually employed is first passed into the cylinder. Then by means of special injectors the insulating material—which is either of a refractory or vitreous nature—in a powdered state is forced in and projected on the walls of the cylinder. It attaches itself thereto and is said to penetrate the metal to a depth of 1-11 mm. The surfaces are afterward easily turned up in a lathe.

Owing to the increased demand for its chain elevating and conveying machinery, as well as its detachable and special chains, the Jeffrey Manufacturing Company has found it necessary to carry a stock of chains, sprocket wheels, boots and other specialties in the East, and has therefore arranged for office and wareroom at 168 Washington street, which is located between Cortlandt and Liberty streets. It will occupy its new quarters on September 1 and will be pleased to have its old friends, as well as all users of machinery in its line, call at the address given. The works of the Jeffrey Manufacturing Company are located at Columbus, Ohio, and consist of a plant of over 5 acres, most of which is covered by substantial buildings necessary for the manufacture of its machinery. It has now in course of erection a three story brick shop, 50x40, and an additional warehouse, 40x170. This is one of the best equipped plants in the West for special machinery of its manufacture, and an establishment of which the city of Columbus is proud. Catalogues of the company's manufactures can be had on application.

THE "Hamilton" Felt.

"Best and Most Economical Made."

Wise Paper Makers

don't always want to buy high priced imported Felts, nor do they want to experiment with inferior grades of domestic ones. The "Hamilton" answers their requirements in every respect.

In ordering, mention kind of stock used, quality of paper made and speed of machine.

Schuler & Benninghofen, Hamilton, O.

The W. S. Tyler Wire Works Co.,

CLEVELAND, OHIO,

MANUFACTURERS OF

FOURDRINIER WIRES,

Cylinder Faces and Washer Wires.

GRANGER Foundry and Machine Co.,

MANUFACTURERS OF

Breaker Calenders,
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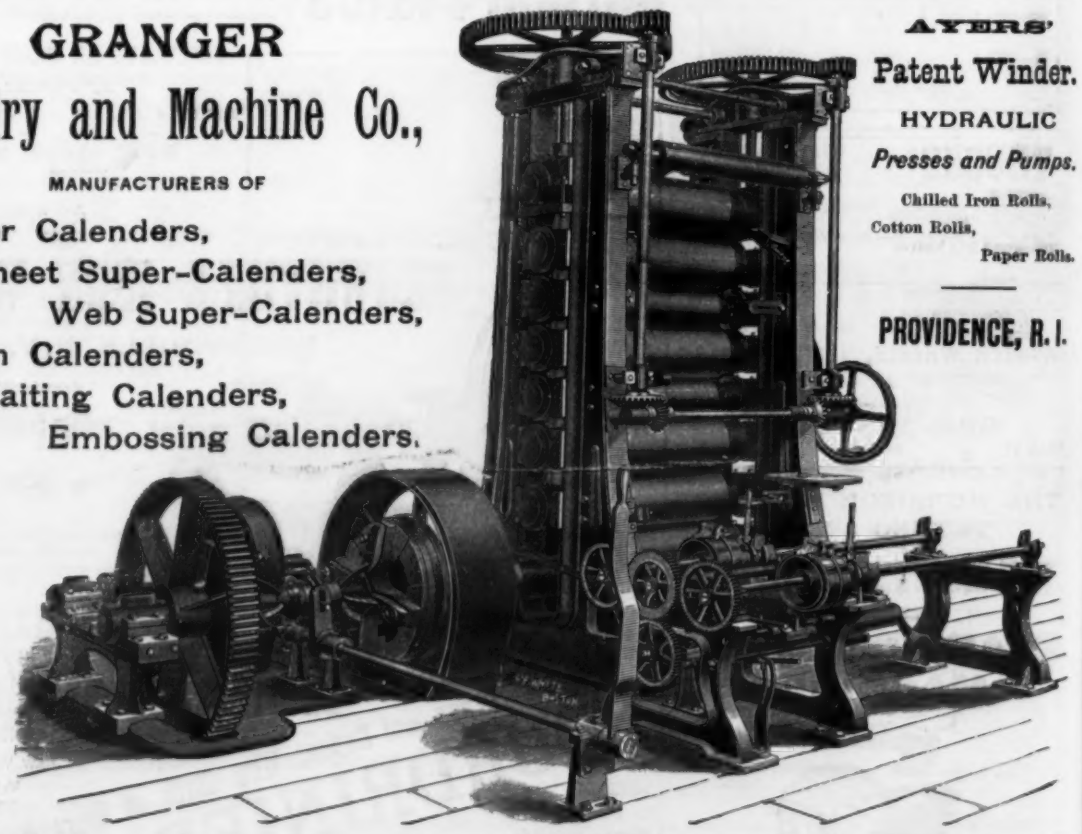
Web Super-Calenders,
Friction Calenders,
Plaiting Calenders,
Embossing Calenders.



AYERS' Patent Winder.

HYDRAULIC Presses and Pumps.

Chilled Iron Rolls,
Cotton Rolls,
Paper Rolls.

PROVIDENCE, R. I.

THE GRINNELL AUTOMATIC SPRINKLER,

BOTH

WET AND DRY PIPE SYSTEMS.

ESPECIALLY CONSTRUCTED to resist the effects of adhesive corrosion or sediment, both inside and outside the sprinkler.

ALL MOVING PARTS are joined together by the fusible solder and are lubricated by it when it melts.

A GLASS VALVE, non-corrodible, non-adhesive and impenetrable.

For Information and Proposals apply to

PROVIDENCE STEAM and GAS PIPE CO., Providence, R. I.

OFFICES:

BOSTON, 173 Devonshire St. ST. LOUIS, 403 North Broadway. CHICAGO, 115 Monroe St.
BUFFALO, cor. Erie and Terrace Sts. CLEVELAND, 50 Euclid Ave.

AUTOMATIC FIRE ALARM AND EXTINGUISHER CO. (Limited),
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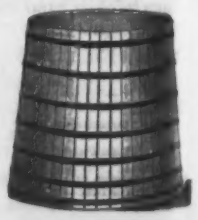
PHILADELPHIA OFFICE, 49 South Fourth Street. PITTSBURG, 64 Fifth Avenue.

GEO. WOOLFORD, Manufacturer of all kinds of CEDAR TUBS FOR PAPER MILL WORK, DRAINERS, STUFF CHESTS, WATER TANKS, &c.

In sending for estimates state if measurements are inside or outside and thickness of wood desired.

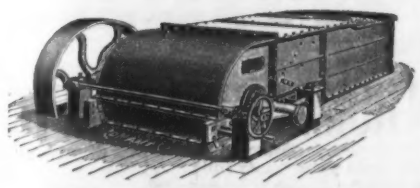
2240-42-44-46-48 North Ninth St.,
PHILADELPHIA PA.



ADVERTISEMENT.

J. H. HORNE & SONS COMPANY, Lawrence, Mass., manufacturers of Pulp Engines, exclusive licensees under the **HOYT PATENT** recently sustained by the Supreme Court of the United States, and owners of the **HORNE PATENT** for the improvement thereon. Our improved **HORNE ENGINE** has already gone largely into use and we are prepared to continue to supply the same to the trade. **J. H. HORNE & SONS COMPANY,** Lawrence, Mass.

THE J. H. HORNE & SONS CO., LAWRENCE, MASS.



THE "HORNE" ENGINE.

120

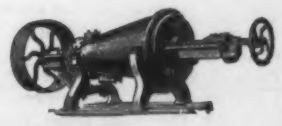
NOW IN OPERATION.

BUILDERS OF **HIGH GRADE** EXTRA HEAVY

PAPER MACHINES.

OUR NEW **MONARCH** MACHINE

IS ESPECIALLY DESIGNED FOR FAST RUNNING.



THE "HORNE" JORDAN.

IS FAST REPLACING

ALL OTHER MAKES.

Windsor Locks Machine Company,

MANUFACTURERS OF
JORDAN ENGINES,
DRYERS,
Rotary and Stuff Pump Reels,
RAG CUTTERS,

WINDSOR LOCKS, CONN.,

Screen and Vats, Engine Rolls, Suction Box Plates, Tube Rolls, Stock Boxes of all kinds, Roll Bars, Bed Plates and Rag Knives.

JORDAN ENGINES Refilled and FILLING kept constantly on hand.

"AEROPHOR" PAPER DAMPENER.

Dampening One Side of Paper.

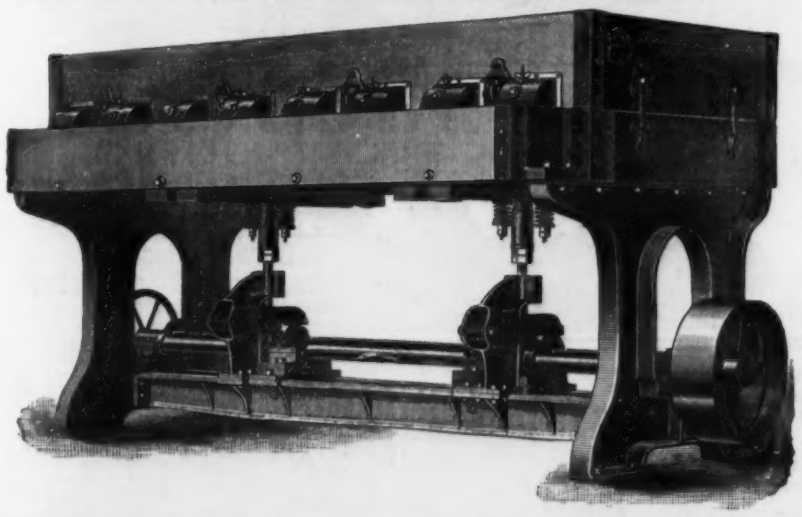
Built for any position, and to dampen ONE or BOTH sides of the sheet, the size of the Dampener being determined by the width of your calender face.

ADOPTED BY THE LEADING BOOK, NEWS, COLORED AND MANILLA MILLS.

DOES ELECTRICITY ANNOY YOU?

The "Aerophor" Dampener Destroys Electricity.

THE U. S. AEROPHOR AIR MOISTENING AND VENTILATING CO.,
111 Pine Street, Providence, R. I.



THE MILLIKEN

NOISELESS PULP SCREEN.

SIMPLE, DURABLE, PERFECT, COMPACT.

COMPLETE, NOISELESS, NO STRINGS, LESS POWER.

Plates are sure to last longer, and but two-thirds the number being necessary. No waste of stock when washing up.

Occupies a small space; a simple, solid built flooring the only foundation necessary.

Six (6) hours' time only required to put in position ready for work.

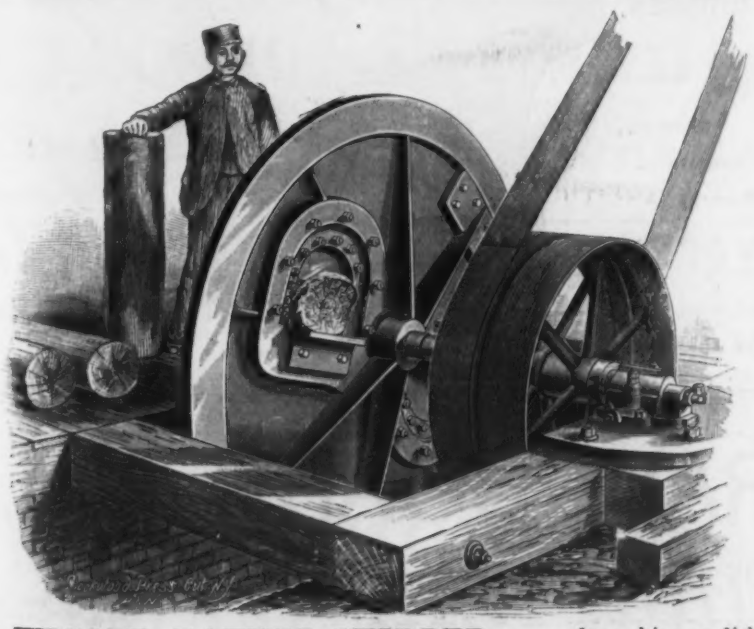
Excellent work accomplished with eight (8) plates and 11-1000 screen plate.

In ordering the Screens no particulars are required.

IT HAS NO EQUAL AS TO SCREENING QUALITIES, CAPACITY AND SAVING OF STOCK.

WARRANTED. THREE MONTHS' TRIAL GIVEN. ADDRESS

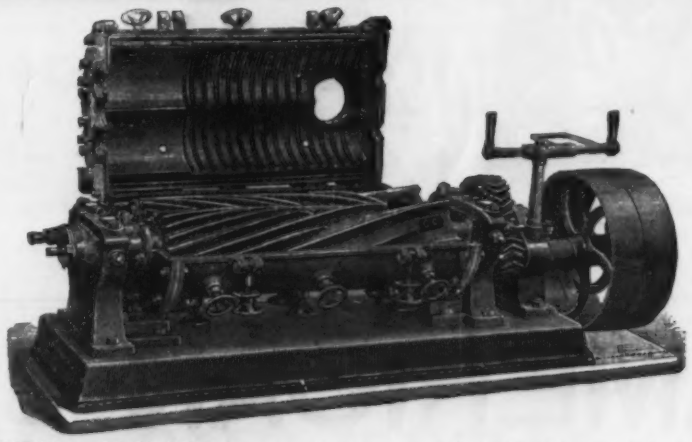
C. R. MILLIKEN, PORTLAND, ME.



WIGGER PATENT CHIPPER can produce chips or disks up to 2 inches thick and 12 inches in diameter and requires only 8 to 10 horse power. Is in use in all the leading mills in Europe and the United States.

250

Testimonials proving the superiority of this Machine for different kinds of stock can be seen.



TRITURATOR replaces beaters on soft stock and assists beaters on hard stock in saving 50 per cent. beating time. Space required, 6 × 3 feet.

Daily capacity by using 7 to 8 horse power:

Straw	4.5 tons.
Ground wood	15 "
Waste paper	4 "
Rags	1.7 "
Partly cooked sulphite and knots	3.4 "

WE WILL FURNISH PLANS AND SUPERINTEND THE CONSTRUCTION AND STARTING OF PAPER MILLS, PULP AND SULPHITE MILLS; UNDERTAKE ANY ALTERATIONS, ENLARGEMENT OR REPAIRS OF MILLS NOW RUNNING. CORRESPONDENCE SOLICITED BY

WENDLER & SPIRO, Chemical and Civil Engineers, WATERTOWN, N. Y.

LOCKE BROS.,

SALEM, MASS.,

— MANUFACTURERS OF —

Superior Damper Regulators, Reducing Valves

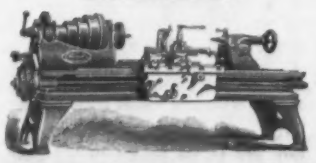
AND OTHER STEAM APPLIANCES.

SEND FOR OUR NEW ILLUSTRATED CATALOGUE.

NEW HAVEN MANUFACTURING CO.,

NEW HAVEN, CONN.,

MANUFACTURERS OF



Lathes, Planers, Drills, SLOTTERS, &c.

Fuel Economy in Boiler Firing.

With the variety of fuels on the market the problem how to most economically fire a boiler is a perplexing one varying for every locality. The owner of the sawmill finds his fuel near at hand in the form of slabs and sawdust, and like many others is relieved of the necessity of choosing. But to the average steam user who has hard and soft coal alike offered him by dealers, and equal transportation facilities, the question which kind of fuel, hard or soft, or if hard which size will give him the best economy, is an important one. Soft coal will give the greatest evaporation per pound of fuel, but it is very possible that a cheaper coal, though more of it may be used, may be more economical. Or further, it may be found possible to so alter the conditions of burning by use of forced draft, thin fires, &c., that the cheaper coal may be really the cheaper. Of course the proper way for every steam user to deal with the matter is to make his own evaporation tests. This, however, involves expert work, or knowledge and the use of apparatus not available to everyone. The next best thing is to get the evidence of someone who has tested the fuels at various prices and in various ways. Then, though the prices for fuel under which the tests were made may differ from those in the vicinity of the reader, still, having a scale of the relative evaporative efficiencies of the different fuels, it is easy for him to determine which is the most economical for him to use.

Among the conditions governing economical running of a boiler plant there is probably no one more important, no one in which there is more variation in practice, than the management of the draft. Ordinary attendance implies keeping the boiler clean inside, preserving an even water level while steaming, clean bright fires, &c. But in the kind of draft and its management lie the fine points of boiler firing, in getting a draft that will supply the greatest amount of air to the fuel, yet will not carry too much heat up chimney.

The complaint commonly urged against forced draft is that it allows too much heat to escape up stack. If the damper is wide open that is the case. However, in order to get the advantages claimed for forced draft, namely, high power, quick fuel consumption, a hot fire, it is not necessary to run with wide open damper. Forced draft can be so used as to give a greater output of power, without evaporating less water per pound of coal, than with the use of the natural draft. Of course there will be more fuel burned, as more power is developed. The philosophy of keeping the damper down as far as possible is that thereby the fire spaces become packed with burning so highly heated gases, which go off at a high velocity, instead of as a comparatively lazy current through a wide opening, as in the case of natural draft. In general there should not be such an excess of pressure as to inconveniently drive out the ashes around the ash pit doors.

With a 156 horse power Babcock & Wilcox boiler two tests of soft coal gave 8.70 pound water evaporated per hour at 212° Fahrenheit per pound of coal. Three tests of pea coal gave 7.87 pounds per pound coal, forced draft. Four tests buckwheat coal gave 7.86 pounds per pound of coal, forced draft. Two tests washed culm gave 7.46 pound per pound of coal, forced draft.

Hence it follows that for an equal economy (providing the fuels do not have more refuse than the amounts to be given further on) in any district, pea and buckwheat must not cost more than 5 per cent. more than washed culm, and soft coal not more than 16 per cent. more than culm, or 11 per cent. more than pea or buckwheat. The average per cent. of refuse for the soft coal was 7 per cent.; for culm, 18 per cent.; for buckwheat, 18 per cent.; for pea, 15 per cent. With so large a percentage as in these last the question of getting rid of the ashes becomes serious, and the extra expense of handling should of course be taken into account when the contest between hard and soft coal is close.—*Bertram Flint, in Mechanical News.*

Water Tube Boilers.

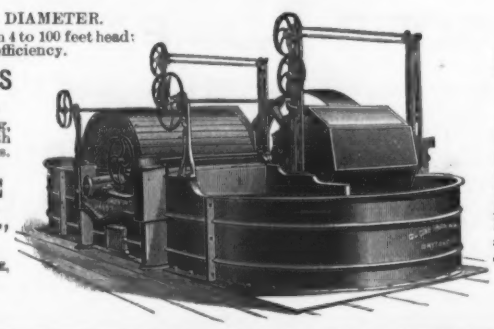
Water tube boilers are rapidly encroaching upon the field so long held by the fire tube boiler, and every year sees some new type put on the market. It surprises even those who are supposed to know what is going on to see the aggregate horse power of water tube boilers installed within five years last past. The maker of a water tube boiler practically unknown five years ago, has within this period sold nearly 500 boilers, from 10 horse power up to 1,200 horse power each. Other companies have not sold so many, but they have sold a great many, and if the demand continues, as it undoubtedly will, the water tube boiler will be practically the only one in use. Water tube boilers are not confined to any special duty, but are to be found in all kinds of work on land and sea, and the rapidity with which they are coming into service is worth this brief mention.—*The Engineer.*

NEW **AMERICAN TURBINE.**

FROM SIX TO SIXTY-SIX INCHES DIAMETER.
Are in practical operation under heads from 4 to 100 feet head: are strong, durable and give high efficiency.

BEATING ENGINES
Cast Iron or Wood Tubs.
Made heavy and strong, double lightered, with well made Cone Washers.

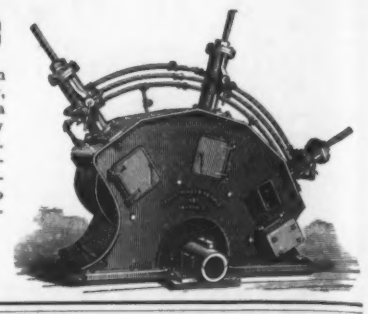
DAYTON GLOBE IRON WORKS CO.,
Successors to STOUT, MILLS & TEMPLE,
Dayton, Ohio, U. S. A.



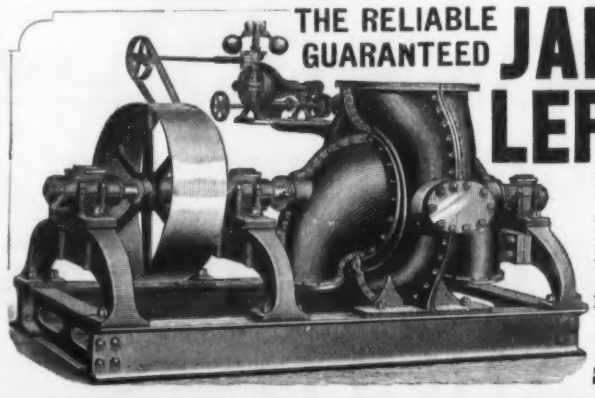
D. T. MILLS'
WOOD PULP GRINDER

Superior in construction to any made. Capacity, 4,000 to 6,500 pounds extra good pulp per day, dry weight, per each grinder. Hydraulic feeds, fine adjustments; strong and reliable in every way. Two and three pocket machines.

Descriptive Catalogue Sent Free.



THE RELIABLE GUARANTEED **JAMES LEFFEL WATER WHEEL**

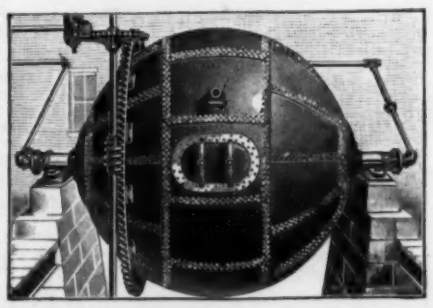


SIX inches to NINETY-SIX inches diameter, under heads ranging from 2 to 350 feet, in many of the finest paper mills of this country, several companies using TWENTY to THIRTY-TWO Leffel Wheels each.

Their New Wheels give HIGHER SPEEDS under low heads, and LOWER SPEEDS under high heads than any Water Wheel now made. **MANY STYLES ON HORIZONTAL SHAFTS**

The Company are now in better condition than ever before to supply these justly celebrated Wheels with dispatch and promptness. Send for their fine catalogue, nicely illustrated, and write them your wants fully. Address

THE **JAMES LEFFEL & CO.,**
SPRINGFIELD, OHIO, or 110 Liberty St., New York City.

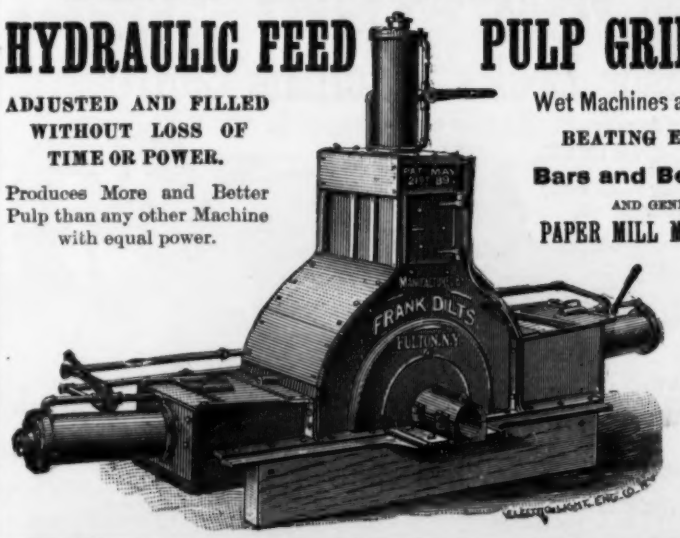


THE J. C. McNEIL CO.,
MANUFACTURERS OF
ROTARY GLOBE BLEACHING
AND OTHER BOILERS FOR
Straw and other Pulp,
— ALSO —
All kinds of Boilers and Heavy Sheet and Boiler Iron Work for PAPER MILLS a Specialty.
Send for New Catalogue No. 19,
THE J. C. McNEIL CO., Akron Boiler Works, AKRON, OHIO.

DILTS' IMPROVED THREE AND FOUR POCKET
HYDRAULIC FEED PULP GRINDER.

ADJUSTED AND FILLED WITHOUT LOSS OF TIME OR POWER.

Produces More and Better Pulp than any other Machine with equal power.



Wet Machines and Screens.
BEATING ENGINES,
Bars and Bed Plates
AND GENERAL
PAPER MILL MACHINERY.

MANUFACTURED BY
FRANK DILTS,
Fulton, N. Y.

THE LOWVILLE IRON WORKS CO.

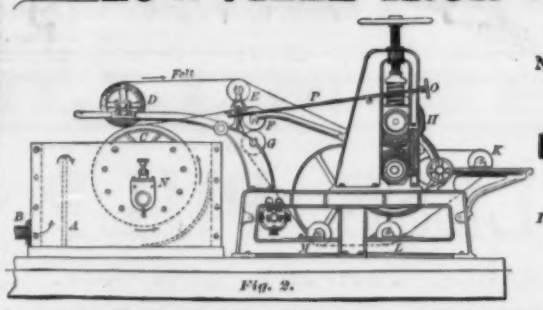
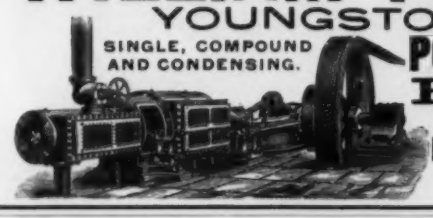


Fig. 2.

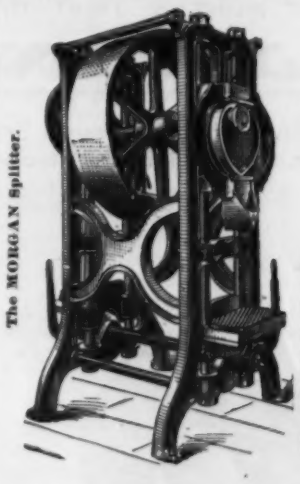
MANUFACTURERS OF THE
Newest and Most Improved
HYDRAULIC
Feed Grinder,
TWO, THREE OR FOUR POCKET.
Improved Wet Machines, New Model Barkers, Knot Borers, Chippers, Splitters and all kinds of
MECHANICAL WOOD PULP MACHINERY.
Write for Estimates.
Lowville, N. Y.

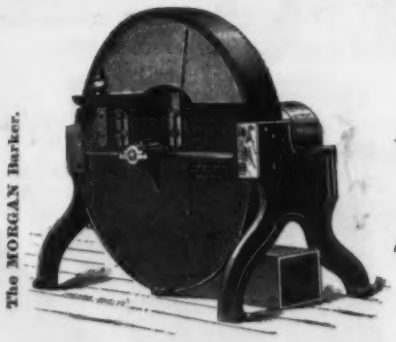
WILLIAM TOD & CO.
YOUNGSTOWN, OHIO.



SINGLE, COMPOUND AND CONDENSING.
PORTER-HAMILTON ENGINE
Blowing Engines,
Hydraulic Cranes & Accumulators
Heavy Special Machinery.
ENGINE CATALOGUE ON APPLICATION.

APPLETON MACHINE COMPANY,
APPLETON, WIS.,
— MANUFACTURERS OF —
The New Frambach and Badger Pulp Grinders,


The MORGAN Splitter.


The MORGAN Barker.

Wood Barkers,
Splitters,
Screens,
Bolt Sawing Machines,
Knot Borers,
Chippers.
Sulphur Burners and Wet Machines.

GOODRICH Screen.

ORGANIZED JULY 1, 1889. CAPITAL, $4,000,000.

AMERICAN STRAW BOARD CO.,

Manufacturers of STRAW BOARDS, PULP LINED BOARDS, Lined Straw Boards, Combination Boards,
BINDERS' BOARDS, FRICTION BOARDS.
"LIGNISTRA" (A SUBSTITUTE FOR PLASTER.) BUILDING BOARD, PLAIN BOARD, TARRED BOARD, WATERPROOF BOARDS,
Barrel Layers, Peach Baskets, Egg Cases and Fillers.
Popular Prices! Attractive Terms! Prompt Shipments! General Office, PULLMAN BUILDING, CHICAGO.
AGENCIES: NEW YORK, 102, 104, 106 Wooster St. BOSTON, 46 Federal St. PHILADELPHIA, 121-127 N. Fourth St. CINCINNATI, 101-103 Walnut St. CHICAGO, 152-153 Michigan Ave.

Management of Belts.

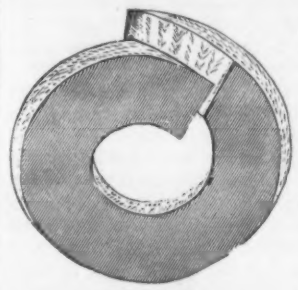
We watched an engine tender the other day at work on a belt, which showed above all things that he didn't understand the why and wherefore of belts and bedding. Someone at one time or another had put in a short piece of rubber belting to lengthen out with, and while the leather part was all right the rubber part gave out and broke at the lace holes. What did he do? What he had done before, cut off the ragged edge and laced it up once more, never thinking that each time the belt was shortened the tension upon it when laced increased. Every time he put the belt on it broke in less than a minute, until we suggested a new piece of leather in place of the rubber, and proposed a piece longer than the rubber was originally. "That wouldn't do; it would be too loose."

But it did do, and when the load is on that belt is as slack as it should be on the slack side. This reminds us of another case where we ran across a man lacing a belt, and after every effort it broke. It looked like a hopeless task to get that to hold, when at last it went off all right. We had concluded there would be another break, so had some curiosity to see why it didn't this time. It appeared that the engineer had failed to secure the lacing when he finished, so the lacing pulled out several holes before it caught and thus lengthened the remainder to fit, practically lengthening out the belt 3 or 4 inches. The tension was enough to drive the load but not enough as to break the belt. It does not do to have a belt too tight. It ruins the belt and there is a big friction loss also.—*Boston Journal of Commerce.*

British Thermal Unit.

It is customary to state the performance of a steam engine in pounds of steam used per horse power per hour, a method that is open to objection, since the value of a pound of steam depends on the pressure and quality of steam. Professor Peabody and others are urging that the British thermal unit should be used instead. This unit, sometimes called the pound degree, is the heat required to raise a pound of water one degree of temperature, and is equivalent to 778 foot pounds. Stating the efficiency of an engine in heat units is advocated, not only because it is thoroughly theoretical and practical, but because it affords a simple and correct way of finding the efficiency of the engine, while the other method is liable to lead to confusion and error.

The manufacturer, however, is uninfluenced by these scientific methods beyond what they may improve existing devices, for the test that interests him most is how many pounds of coal he must burn to obtain 1 horse power. The efficiency of the whole plant is the point he wishes to consider, but in the majority of cases they are seldom made. There is little doubt that if careful tests were made the average performances of most steam plants would be found pretty low; and little leaks here and there make a considerable total.

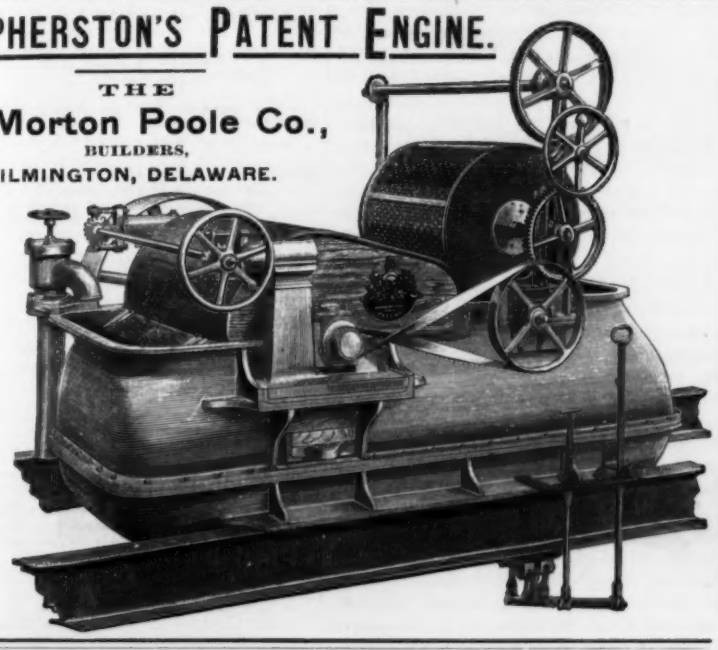

TRADE MARK.

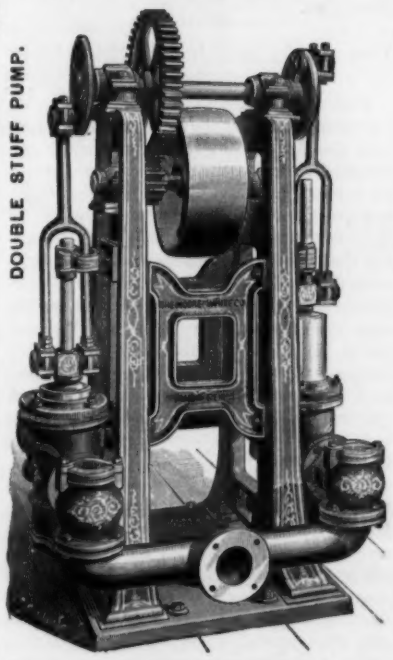
GOULD'S STEAM AND WATER PACKING.
ORIGINAL RING PACKING FOR
Piston Rods, Valve Stems of Steam Engines, Steam Pumps, and especially adapted for Electric Light Plants.
☞In Ordering give exact DIAMETER OF STUFFING BOX AND PISTON ROD OR VALVE STEM
SELF LUBRICATING, STEAM AND WATER TIGHT.
Less friction than any other known packing. Never grows hard if directions are followed. Does not corrode the rod.
EVERY PACKAGE FULLY WARRANTED. Price List on application. Correspondence solicited.
THE GOULD PACKING COMPANY,
ALBION CHIPMAN, Treasurer. 88 Cambridge Street, EAST CAMBRIDGE, MASS, U. S. A.

FIG. 200. REGRINDING GLOBE VALVE.

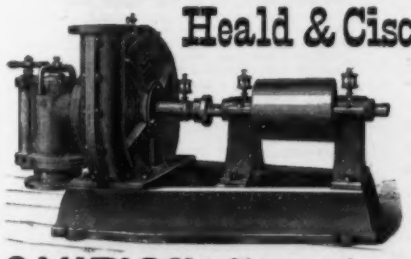
Lunkenheimer's Regrinding Globe and Check Valves,
For over thirty years the only strictly first-class valves on the market, are to-day more popular than ever. To have really good valves and make no mistake, it is only necessary to use "LUNKENHEIMER'S" Valves. We manufacture a full line of superior brass and iron steam goods and many specialties. For sale by dealers. Send for Catalogue and mention this paper.
THE LUNKENHEIMER BRASS MFG. CO., Cincinnati, Ohio, U. S. A.

FIG. 205. REGRINDING CHECK VALVE.

UMPHERSTON'S PATENT ENGINE.
THE
J. Morton Poole Co.,
BUILDERS,
WILMINGTON, DELAWARE.


THE MOORE & WHITE CO.,
15th Street and Lehigh Avenue,
PHILADELPHIA,
Germantown Junction Station
Pennsylvania R.R.

DOUBLE STUFF PUMP.
Paper Machinery
FOURDRINIER
AND
Cylinder Machines,
FRICTION
CLUTCH
PULLEYS,
&c., &c.

THREE PLUNGER SUCTION PUMP.

THE OLD RELIABLE
Heald & Cisco Centrifugal Pump.

MORE OF THEM USED BY PAPER MAKERS THAN OF ALL OTHER KINDS COMBINED.
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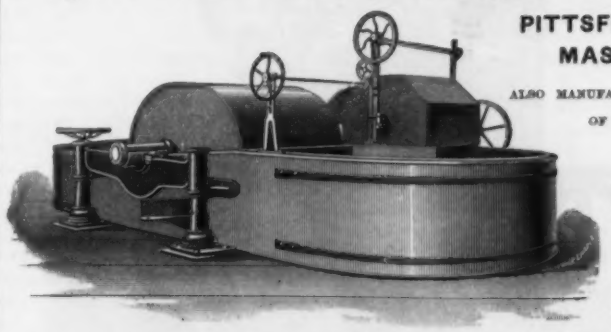
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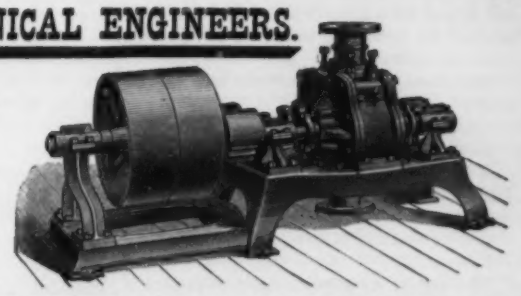
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Transmission of Power by Electricity.

Power for manufacturing purposes is now commonly obtained in two ways, viz., by water and by steam. The question is often asked which is cheaper to employ, water or steam power. The question can only be answered by a calculation in each special case. In case of water power the factors are usually cost of developing the power, freight rates and cost of labor. In case of steam power the factors are usually cost of fuel, freight and cost of labor. In some cases the interest on the cost of developing the water power would exceed the cost of fuel.

Very many excellent water powers are inaccessible to means of transportation. Much study and experiment have lately been devoted to the subject of developing such powers and generating electrical currents, then conducting the current to distant point or points convenient for operating manufacturing plants and developing power by means of the current.

This is done, for short distances, in cases of all electric street railways, steam being the original source of power, however, in most cases.

In Germany 100 horse power has been successfully transmitted over 100 miles and successfully utilized. This power was utilized at the Frankfort Exposition. In the United States power has in several instances been transmitted 20 to 40 miles with some degree of commercial success. Entirely satisfactory results have not yet been attained for distances greater than 18 to 20 miles.

For the purpose of operating the street cars the current is what is known as the direct current. It is commonly generated at a central point at about 500 volts pressure, and may be utilized from a conductor at points anywhere along the conductor and to a distance of 5 to 7 miles from the station. The current is generated at 500 volts, and is conducted over the wires and utilized at the same pressure.

For utilizing water powers and transmitting the power by electricity, alternating currents seem to promise most in the matter of long distance transmission. The alternating current may be generated at, say, 300 volts pressure, which is a current not dangerous to human life. Then by means of a converter, which is a sort of induction coil, this 300 volt current may be converted into one of 5,000 or 10,000 or even 50,000 volts. The higher the pressure the smaller the wire necessary to transmit a given power. At a very high pressure a comparatively small wire may be used for the transmission, but the very high pressure is very dangerous, and, therefore, at the point where it, is to be used it is reconverted again to, say, 300 volts and utilized to operate a motor. When it is desired to transmit power from a water power to a distance of, say, 20 miles, the following equipment would be necessary:

The necessary water wheels and power house.

Generating dynamos.

Converters.

A line of wire (copper) from the generating plant to the point where power is to be utilized.

Converters.

Motors.

The cost of a complete plant to generate current and transmit power about 10 miles would be about $150 per horse power—that is to say, the plant necessary to deliver 100 horse power a distance of 10 miles from the water power would be about $15,000.

To deliver 100 horse power 20 miles from the water power would require a plant that would cost about $175 per horse power, including development of water power and buildings. For short distances the wire is strung on poles as in the case of electric railway plants, but for greater distances those best informed on the subject think it best to lay the wire inside of pipes filled with oil, the oil being the insulating material.

The field of power transmission by electricity has not been much explored. There is nothing in the way of its successful accomplishment, except that the shops in which the machinery can be built are pressed with orders for electric railway machinery, and really can hardly afford to abandon a developed line of trade to explore a field which is yet very little worked. When it is considered that in the United States over 400 electric street railways have been built in the last ten years, and that all the machinery has been constructed by what are practically now two companies, viz., the Thomson-Houston-Edison combination and the Westinghouse, it will be appreciated that the wonder is that so much has been done.—*Manufacturers' Record.*

Defective Boilers and Incompetent Engineers.

The official quarterly report of William S. Powers, superintendent of steam boilers, to Police Commissioner Hayden, of Brooklyn, N. Y., shows that from April 1 to June 30 667 steam boilers were examined in that city, of which eleven were condemned, removed and good boilers substituted. It states further that 612 engineers were examined, and of these fifty-one found incompetent. The report does not state that the incompetent engineers were removed and able ones substituted; we trust they were, but we cannot help calling attention to the fact that eleven boilers out of 667 is a ratio of only sixteen bad boilers per 1,000, while fifty-one incompetent engineers out of 612 is a ratio of thirty-three incompetent engineers out of 1,000, so that the number of incompetent engineers is more than five times larger than the number of defective boilers.

The comparison of these figures shows that the boiler makers take five times more care in the manufacture and repair of their boilers than do the engineers in trying to learn their trade, who, when once having obtained employment, need looking after, as well as the boilers, in fact five times more so, according to discovered ratio of capability for duty. In addition to this it must be remembered that boilers, being inanimate objects, are in themselves not subject to blunders, to carelessness, to strikes nor to drunkenness, in fact possess in this regard reliability equivalent to infallibility compared with the weaknesses and incidental shortcomings of human beings, of which the futility has become proverbial.

If this quarterly report is the average of every three months for the whole year, then there are forty-four worthless boilers condemned per year, while the number of engineers proved to be incompetent for the performance of their duties is not less than 482, to whom life and property are intrusted. It proves also that in regard to the causes of the many boiler explosions reported in the newspapers from time to time at least five are due to incompetent engineers, against one by incompetence of the boiler itself, of which the practical strength is only equal to the weakest part thereof.

Matters will only grow better in this regard when owners and managers of steam power come to the conviction that it is necessary to place the compensation of steam engineers high enough to make it an object for men of a better class, that means men having received a more liberal education than is the case now in the great majority of instances.

We mean by a liberal education such as is not confined to understanding the manual treatment of a steam engine in making it go, but the understanding of the scientific principles which lie at the basis of their calling, such as the laws of expansion of steam at different temperatures, of latent heat, of capacity for heat or specific heat, of combustion and draught, of units of heat, of the comparative value and economy of fuel, the laws of air pressure and the vacuum, &c.

A striking illustration was offered in this respect several years ago in the explosion of the Staten Island ferryboat Westfield, 1871, while she was lying in her slip. She was crowded with Sunday excursionists, when, a moment before starting, her very large boiler exploded, lifting up her deck, with disastrous result, many persons being killed. At the inquest it was found that the engineer, who was a colored, illiterate man, advanced from being a stoker to the responsible position he occupied, was entirely responsible for the appalling loss of life. The examination at the inquest revealed the fact that he had not the least idea of the air pressure or a vacuum, of which he had never heard, that he supposed that when he kept the boiler entirely full of water it was all right, &c. — *Scientific American.*

Fire Risks in Electric Lighting.

From a communication sent to us by a prominent insurance company it appears that the fire underwriters are greatly disturbed by the increased fire losses said to be due to electricity. They claim that there is a great need of better understanding of this matter by the fire underwriters, for under the present circumstances they say it is contemplated to charge for the use of electricity in a building—that is, to increase the rate where electricity is used. We are asked by them to solicit articles on this subject from those who have had experience in this field, and to publish as much information as possible for the mutual benefit of the insurance companies and those insured.

Although we would not like to indorse the statement that fires are caused by electricity as often as has been claimed, yet we do agree with the insurance companies that the matter ought to be perfectly understood and agreed to by both parties. It is evident that electrical conductors in a building can start fires if improperly laid, but it is just certain that wires may be run so as to be perfectly safe. There are two things to be done: First, it ought to be determined as definitely as possible exactly what is safe wiring if properly installed, and what is not. The insurance companies ought to make their very best efforts in conjunction with the electric light companies to determine this in an impartial and thorough manner, and they ought to be just as careful not to make any unreasonable rules and requirements as to make those that are reasonable. This is evidently to their own advantage, for by requiring precautions which are unreasonable they will injure themselves, as the tendency of wiremen will be to object to and try to avoid the rules wherever they can. Secondly, having established such rules, they, as well as the owners of buildings, ought to see that these rules are rigidly adhered to and strictly enforced.

This is, perhaps, even more important than the laying down of the rules, for with any reasonably good method there ought to be little danger if the work is well done. Unfortunately, the existing cutthroat competition among wiremen leads to underbidding, which results in a careless and inferior class of work. The best system, if improperly laid, may be of the most dangerous character. This is particularly the case in concealed work, in which the wiremen have an opportunity to cover up defects trusting that they will not be discovered by the inspector and that they will get their money before a fire is started. It is for this reason that among all electrical artisans the wireman is, apparently, the most unreliable. In almost all other classes of work a mistake is discovered, and the responsibility can be placed; but if a fault in wiring causes a fire the wireman feels that he is safe, and that all proofs of carelessness have been destroyed by the fire, and he can safely say that it cannot be proved to be a fault of his, that it was probably caused by water, by the plumber, or the carpenter's nail; or, if all other excuses fail, he attributes it to rats, as no one can deny that the rats did it.

Assuming that wiring can be made safe, and there is no question about that, what is wanted most is a thorough understanding as to what the requirements are, and then to employ only such wiremen as have good reputations and whose aim it is to keep them and not merely to get their money. Giving the work to the lowest bidder is a very poor, shortsighted and dangerous policy in wiring a building. Give the work to the man who has a good reputation and is anxious to keep it, and then pay him enough to enable him to be conscientious. Careless, dishonest wiremen, such as many of them are, ought to be branded and then starved out of business, as they are dangerous both to employers and the owners of buildings.

When we are sick we do not employ the "lowest bidder" doctor; why then should we be less wise when our property instead of our lives is at stake? It is of interest alike to the electrical fraternity as it is to the insurance companies to see that the safest methods are adopted, provided they are not unreasonable, and then to make it compulsory that these should be properly carried out. Another way out of the difficulty is to let all buildings wired for electricity be insured among themselves, so that each one is more directly interested in the adoption of the safest methods.—*Electrical World.*

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CHAPTER II.—**Fibres.** Cellulose in its relations to the plant; the vegetable cell; the cell wall; changes which occur in the cell wall; lignin or incrusting matter; its chemical properties; characteristic markings of the cell wall in different fibres; characteristic cells other than fibres in different pulps. Classification of fibres: 1. Seed hairs; cotton, chemical and physical character of fibre, dimensions, analyses. 2. Bast fibres, as linen, jute, hemp, manilla, rhea, ramie, agave, sisal, adansonia, &c.; occurrence in plant, separation of filaments; character, size, distinguishing features of filaments and ultimate fibres, analyses and chemical properties. 3. Fibres and other cells from whole stems and leaves, as straw, esparto, bamboo; measurements and characteristics of fibres, yields, analyses; characteristic cells found with fibres. 4. Wood fibres: growth of wood; cambium layer; spring and autumn wood; sap and heart wood; resins; bark and knots; analyses of woods; specific gravities; ash; fuel values; occurrence and character of all woods used for pulp making.

CHAPTER III.—**Processes for Isolating Cellulose.** Rag boiling; special treatments for various fibres, as jute, straw, esparto; review of miscellaneous processes for treating wood; the water process, aqua regia, &c.; the soda process, history; preparation of liquors, boiling, washing, recovery, sources of loss; analyses of chemicals and liquors; the sulphite process, history; general principles; the different systems; liquor apparatus; preparation and analyses of liquors; digesters; linings; boiling; subsequent treatment of pulp; waste liquors; recovery. The sulphide and sulphate processes.

CHAPTER IV.—**Bleaching.** General principles; bleaching agents; bleaching powder; deterioration; analyses; preparation of bleach liquors; use in chests, engines, drainers; hot bleaching; acid bleaching; use of alum; chlorination and oxidation of fibre; washing stock, antichlors; loss in bleaching; ozone bleach; hydrogen peroxide; permanganate; sulphurous acid; special processes for various fibres.

CHAPTER V.—**Sizing and Loading.** Rosin; preparation of size; free alkali; free rosin; alum; analyses of alums; free acid; basic alums; sizing power; resinate of alumina; moss; casein; wax; starch; animal sizing; preparation and use; drying; loading; analyses of clays, agalite, pearl hardening, &c.; use; retention; ash; combined water; effect of alum and starch.

CHAPTER VI.—**Coloring.** Mineral colors; vegetable and animal colors; aniline colors; chemical properties; effect of alum and traces of bleach or alkali in different colors; distinguishing tests; effect of different waters.

CHAPTER VII.—**Water and Water Supply.** Character and analyses of different waters; ground waters; surface waters; river water; artesian well water; hard and soft waters; boiler scale; effect of waters on size and colors; various systems of filtration; use of alum; softening water; self purification of streams; natural filtration; effect of storage; vegetation in ponds; crenothrix; consumption of bleach by waters.

CHAPTER VIII.—**Chemical Analysis.** Description of apparatus and methods for testing the purity and strength of all paper making chemicals, colors, &c.; common impurities and adulterants given; full description of methods of analysis for sulphite and soda liquors, bleach solution, alums, &c.

CHAPTER IX.—**Paper Testing.** Full account of the latest German methods for testing and classifying papers; determination of ash; kind of sizing; amount of sizing; free acid and chlorides; strength; proportion of ground wood; kind and condition of fibres.

CHAPTER X.—**Electro-Chemistry,** with reference to bleaching, manufacturing of pulp, manufacturing of chlorine and soda.

APPENDIX.—Metric system; tables of specific gravities; strength of solutions; list of sulphite patents, &c.

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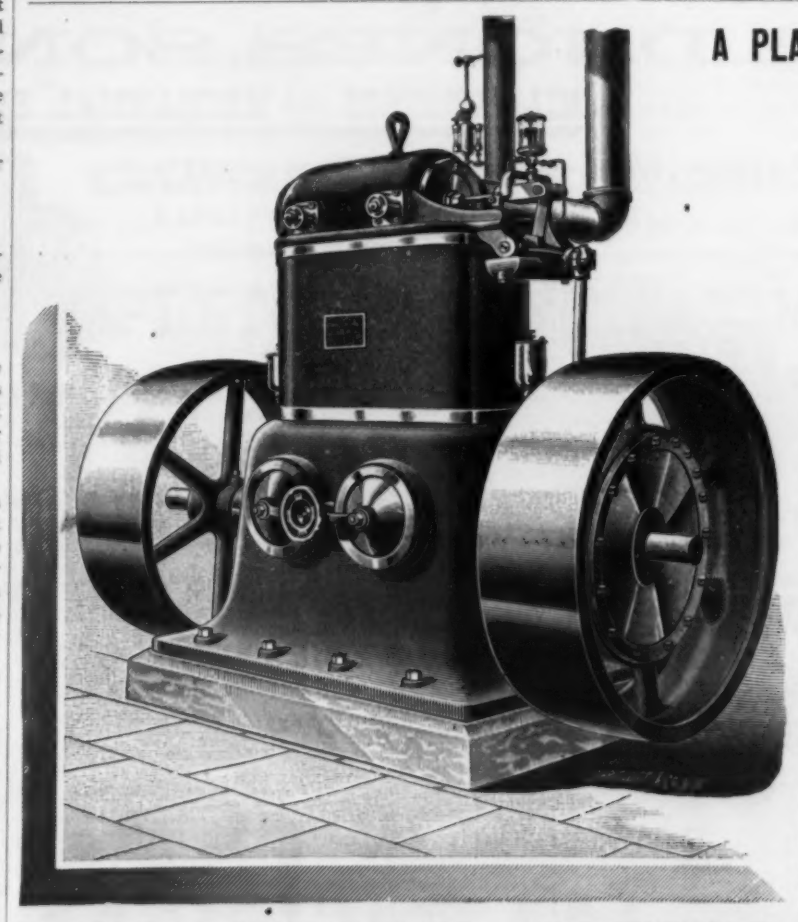

A PLAIN STATEMENT OF FACT.

THE Compound Engine, when non-condensing, so far from possessing an economy superior to the Simple Engine, has been decisively proven, "much to the disgust of the stockholder," to show normal economy only at or about its rated power, and to fall off in economy faster than a Simple Engine as the load falls off; moreover, very much faster under the extreme light loads that are common at times in many industries. This point is at last reluctantly admitted by the more candid builders of such engines, most of whom now advise against compounding for variable loads. The reason is their inability to divide the load and range of temperature proportionately and automatically between the cylinders at all points of cut-off. Hence the low pressure cylinder expands its steam below atmosphere under a moderately early cut-off, thus converting itself into an Air Pump and becoming a load upon the high-pressure cylinder instead of a co-laborer with it. This point was distinctly foreseen by the designers of the Westinghouse Compound Engine and an entirely new principle was worked out, making expansion below atmosphere impossible under any load, however light.

For the first time in the history of Steam Engineering, either Simple or Compound, is built an engine which maintains essentially uniform economy, irrespective of load, and hence, for the first time the Compound Non-Condensing Engine has been made practicable. The results, demonstrated by test, show that where an ordinary Compound will range from 25 lbs. to 70 lbs. water per H. P. per hour from full to quarter load, the Westinghouse Compound, between the same limits, will range from 23 lbs. to 29 lbs. We have not deceived ourselves in this matter and propose that the facts shall be understood. To those interested in the nicer points involved we will be pleased to send a reprint of the paper read by Mr. F. M. RITES on this subject at the late meeting of the American Society of Mechanical Engineers at San Francisco.

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Boiler Defects.

Leaky tubes are without doubt the most frequent and annoying defects that steam boilers are subject to, and when neglected a renewal of tubes and even tube sheets is often the result, which is very serious and expensive, owing to long delays. These defects are usually attributed to accumulation of deposit and scale caused by bad water and worse management and care; low water is another cause without any reference to scale. Now, while the above is true, under any circumstances or conditions, it is also certain that there are other causes producing like and even worse results, and the source whence they originate is not in the operation of the boiler, but in its construction, and so concealed are these defects that it is only after the expenditure of many dollars, if not by some explosion or accident, that they are discovered.

Let the observer follow the tube sheet from flange fire, and it will readily be seen that the greatest of care should be exercised, or serious results will follow. Drifting the tube holes leaves a very sharp edge on the plate, both inside and out, and if this edge is not countersunk cutting off of tubes will be the result, for the expander will press or expand the tube to this sharp edge, thus making an initial rupture, and is completely broken by the expansion of the tube when boiler is in commission; these defects are on the outside of the tube and inside of the boiler, thus making it impossible to see more than the top row, and this, as many boilers are braced, renders it difficult to view the ends.

Again, allowing that care was taken in countersinking holes, the thoughtless or careless workman will, without thought of the effect of his labor, produce even more defects than the latter. Tubes, to be effectual, are so distributed that the best effect is got from the kind of fuel. Given heating surface and water proportionate with unobstructed steam passages, the points to be observed are round holes, straight heads and tight tubes. To obtain these results tubes should be put in scattering and worked gradually, each one taking care to put in some centre to hold the head straight; but often this precaution is neglected, and work is commenced from the centre and each tube is finished or expanded sufficiently if care has been taken to finish, before proceeding to the next. The effect will be that by the time the outer row of tubes is reached the holes will be oval instead of being round, owing to the expanding action, the small amount of bridge between each hole being too weak to hold the strain, and being simply pressed into that shape by the rigid flange and expander.

Another serious defect follows this owing to the hole being out of round; something must be resorted to, and if the tube holes are not cut or reamed round, thus making the bridge weaker, the tube is expanded to such an extent that it is beyond being of any service owing to being reduced so thin and unequal to the strain imposed by expansion and contraction. Should the holes be cut or reamed round, the countersink which was on is therefore cut off and a sharp edge remains, but packing is usually used to fill the hole before expanding, and should the partition or bridge be strong enough to resist the expander without cracking this accumulation of packing will be a very convenient place for scale and deposit to lodge, thus causing leaking tubes. Expensive repairs generally follow; sometimes explosions.—*Stephen Christie in Safety Valve.*

Rubber and Asbestos.

A good many things are now made of the union of the mineral substance of asbestos with the vegetable substance of india rubber. One combination is that which produces woven sheeting, consisting of asbestos woven cloth, coated upon both sides with india rubber, and then vulcanized; it is used as a substitute for asbestos millboard for packing, for steam joints and in other situations where it is desired to resist both heat and moisture, while affording a high degree of elasticity. Asbestos and india rubber woven washers are another product in this line, as are also asbestos and india rubber woven tape for making steam and water joints.

Asbestos rolled cloth packing is made both with and without india rubber core; and what is known as asbestos block packing consists of a rubber back, upon which there are built up, edgewise, a number of layers of asbestos cloth. Sufficient elasticity is by this means imparted by the rubber back, while great durability and protection to the rubber are insured by the use of the mineral. For these purposes the American asbestos is found far superior to the foreign article, its principal qualities of adaptation consisting in an absolute indestructibility even when exposed to the action of any known acid, and also in the highest degree that peculiarity of a self lubricator, viz., a soft, greasy or soapy feeling, which gives such favor to plumbago, soapstone and chalk.

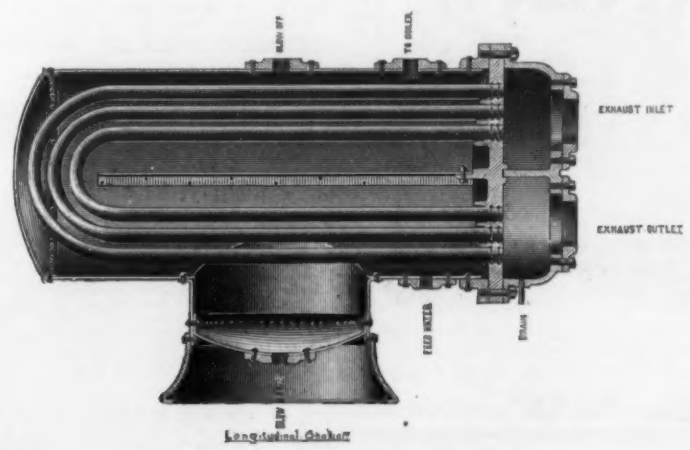
Stilwell's Patent Close Heater.

For more than a quarter of a century the Stilwell & Bierce Manufacturing Company, of Dayton, Ohio, has made a specialty of manufacturing devices for heating and purifying the feed water for steam boilers. Its latest contribution to that branch of industry is the Stilwell patent close heater, herewith illustrated, for which the following points of superiority are claimed:

The heating tubes are seamless brass, U shape, and so fastened into the tube sheet as to be absolutely tight.

The base on which the heater stands serves also as a mud well or settling chamber for the deposit of impurities, which can readily be blown off. Deposits of impurities in this settling chamber do not diminish the heating power of the heater.

The cold feed water enters the heater near to the steam exit end of the tubes, thus offering the most favorable conditions for extracting the most heat from the exhaust steam.



STILWELL'S PATENT CLOSE HEATER.

The diaphragm, which separates the shell into two equal sections, compels the feed water to traverse the entire length of the heating tubes, and its exit from the heater is made at a point in close proximity to the incoming exhaust steam, thus insuring the highest possible temperature of the feed water.

The construction of the heater admits of its being taken apart, if necessary, for cleaning; the tubes and tube sheet can be readily removed from the shell for that purpose.

Parties interested can obtain further particulars by addressing the manufacturer as above.

Manufacturing American Grown Hemp and Flax.

So much has been said about the possibility of profitably cultivating and manufacturing hemp and flax in this country that the report of a visit by a local reporter to the binding twine factory at Fremont, Neb., is of special interest.

We recently chronicled the starting up of a linen factory in Sioux Falls, S. Dak., which is using American flax and is successfully operating fifty looms.

The growth of the linen industry is certainly slow, but as experience demonstrates its probable possibilities Western enterprise will surely seek and utilize favorable opportunities for embarking in it.

The Nebraska works are running in full blast and turning out nearly, or quite, 4,500 pounds of binding twine each day. The hemp, having been properly "retted," is put through two breaks, machines having different sized corrugated rollers 4½ and 5½ inches. These take out the most of the wood of the stem by a shaking process; the fibre is next put through a system of carding machines by which it is straightened out and aggregated in rolls of various sizes which are made smaller and smaller until they are of proper size for going to the spinning or twisting machines. This resembles the spinning machinery of cotton or woolen factories. The twine is rapidly made and wound on bobbins, from which it is rewound by special machines into the large balls set for the grain binders and of proper size. The twine from each ball is tested before it leaves the factory, or as often as is necessary, in order to insure a nearly uniform product as to strength.

The test shows that the strength of the twine varies from 85 to 110 pounds.

The company raised last year about 3,000 acres of hemp of fine quality. This, having been "retted," is what is being worked. The factory this year will make about 8,500,000 pounds of twine. If the crop this year can be cut and retted early, it is hoped to exceed this quantity next year. This seems like a large quantity of twine, but we were informed that it was only about one-tenth of what is used annually in the State.

Flax can be worked as well as the hemp, and when we know that thousands of tons of flax straw go to waste annually—the crop only being raised for the seed—it will be seen what a benefit it would be to have mills in the large flax raising counties of the State utilize the fibre that now is wasted, and build up a home industry of value in the communities where this extravagant method at present is practiced.

A writer in the *Country Gentleman* asks in a recent number about the growing, cutting and breaking of hemp, and the answers succinctly stated are that hemp is usually sown broadcast at the rate of one bushel per acre, although some prefer to drill it in rows about 3 feet apart, using less seed. Any good mowing machine will do for cutting. The "retting process" is the most difficult part to perform.

The point is to carry on the process until the wood is decayed enough to break and separate freely from the fibre. Over-retting gives a weak quality of fibre and will make poor twine. It may look well, but lacks the strength when put to the test.

A ton of hemp will average about 225 pounds of fibre, though it often exceeds this yield in special cases. The fields of hemp were looking well and promise a fine crop.

The hemp crop can be used in rotation with other crops to advantage, and it is not necessarily harder on the soil than several other crops. We were assured this week by a careful farmer, who has raised flax for several years in Nebraska, that he preferred flax to oats and considered it less depleting to the soil. His rotation as practiced was two years clover, two years corn, one year millet for hay, one year oats or flax, using the manure on this crop; one year barley, seeding with clover. This had worked well in his case in Kearney County, and he had prospered. We are aware that the fibre is not as valuable when the crop is raised for its seed, but by using a golden mean a fair crop of seed may be obtained and a valuable crop of fibre as well. In this country we cannot afford to spend time to pull the flax by hand, but we will utilize the harvester or mower and cut it very close to the ground. This may be done very nicely if pains are taken to have the ground smooth and free from clods when the crop is sown.—*Textile World.*

Canal versus Rail Transportation.

For the past half century the attention of the capitalist and engineer has been confined so closely to the development of railways as entirely to overshadow the cheaper modes of transportation by water. In fact there has been engendered a widespread antagonism to the latter system, which has resulted largely in its extermination wherever possible. The evidence of the superior economy of the water route is furnished by the railroad companies themselves in their general efforts to purchase or lease existing canals because of the low rates charged by the latter, which the former could only meet by ruinous cutting.

The very fact of the existence of the waterway has had the effect of compelling the traffic managers of railways to exert every nerve to improve their methods of transportation, so that rates which a few years ago were regarded as the lowest possible have been split in half and still leave a profit. Instead of 8 cents per ton mile the charges are now in some cases but little over 4 mills, and the average for the United States is 0.929 cent. Notwithstanding these great economies, the old, neglected and shallow canal can and does retain its supremacy, and the reasons are not hard to find.

These are due to the lesser resistances to be surmounted, for the cost of all transportation is measured by that of overcoming physical and mechanical obstructions. On the canal there are practically no grades, the friction is that of fluids instead of solids, the capacity of the plant is greater, the cost less, the motor cheaper and the time in transit nearly, if not quite, equal to that by rail. This latter statement is not generally accepted, but it is borne out by the testimony of many competent witnesses before government commissions.

If the same attention were given to improvement of artificial waterways as has been devoted to railways the economy of movement would be greatly increased, millions of dollars would be saved for investment in manufactures or other more permanent forms of improvements instead of being spent in repairs to a short lived and perishable form of plant, and, best of all, the railroad managers themselves would utilize the canals which have become the property of their companies for the enlargement of their revenues, while at the same time they reduced their rates and thus stimulated and increased their business.

Now the energy and attention of their numerous solicitors is expended in securing every pound of freight for the railroad, while the same industry in behalf of the canal would put in motion as large tonnage which cannot be touched at the present rail rates. And yet we find the railroads in many cases patronizing competing canals for the transportation of their own construction materials rather than haul it on lines under their own control and connecting the same terminals. Why, if not because it is cheaper?

Even to-day a comparison between the old-time canal and the most improved and efficient railroad in the country may be made which will show the superiority of the waterway.

Thus a canal terminating in Philadelphia, having a draft of 5½ feet and capable of carrying boats of 175 tons capacity, charged from 40 to 70 cents per ton tolls from the mines to tidewater, 108 miles. This canal has a bottom width of 40 feet and depths of 6½, with locks 110x18 feet. The boats weigh about 65 tons, making a gross load of 240 tons to each team of three mules, or 80 tons per mule, moved at the rate of 1¾ miles per hour. The tractive force was only 1.78 pounds per ton, while on a railroad it is about 9 pounds.

The boat and team cost $2,500, or $38.44 per ton.

The ratio of paying to dead load is 175.65, or nearly three to one. On a first-class modern grain car of 60,000 pounds capacity, weighing 30,000 pounds, the ratio is two to one. The average weight of the box car being 13.4 long tons and its cost $625, the cost per ton of the car is $46.34. But the 125,000 pound locomotive costs $10,000, and the average trainload in the United States by Poor's Manual for 1891 was 163 tons, requiring but, say, six, of the 30 ton cars; hence the motive power per car cost $1,666, or $124 per ton, which, added to the $46.34, gives for the cost of rolling stock per ton $170.34, as contrasted witn $38.44 for the canal. It is true, however, that on favorable grades one engine can handle from forty to fifty cars, thus greatly reducing the cost of motive power, but the averages are a better basis of comparison. The life of the boat is longer also than that of the car, being from eighteen to twenty years.

Now as to the load. One boat's load of 175 tons would fill nearly six cars of 30 ton capacity, or an average train, for which the expenses of movement are much greater; but without going into a detailed analysis of individual items of expense we may take the reported average rates for freight movement per ton mile as being the measure of the aggregate cost of overcoming all the resistances opposed by railroads to traffic.

The lowest rate reported for 1890 in Poor's Manual was that of the Chesapeake and Ohio, which was 0.54, or 5.4 mills, per ton mile. The next lowest was the Louisville and Nashville, on which the rate was 5.7 mills, while the New York, Lake Erie and Western ranks next at 6.4 and the Pennsylvania Railroad comes next at 6.5, and thence the rate rises to 16.1 mills for the Southern Pacific. The average rate of all is over 9 mills per ton mile. Compared with this we have on the canal for captain and crew, $4.75, feed for three mules, $1.59—total for movement of boat per diem, $5.75; depreciation and interest at 20 per cent., $500; total expense for season, $638 per boat, making twenty round trips and delivering 3,500 tons of coal, which is at the rate of 18¼ cents per ton. Adding 8 cents for unloading brings it upto 26¼ cents for 108 miles, or 2.4 mills per ton mile, but as the boats return empty their round trip is in fact 216 miles, and the cost, if there were return loading, would then be but 1.4 mills. In neither case has the roadway been considered. The surprising economy of water transportation is, however, more fully illustrated by the results of the tramp freight vessels on the ocean, which may carry 3,000 tons or more 250 miles a day at a cost of $300, or 10 cents per ton for 250 miles, which is but four-tenths of a mill per ton mile.

Even greater economy has been secured in many of the recent freight steamers built on the great lakes, some of which have a capacity of 3,000 tons on a draft of 16 feet, and one is reported to be on the stocks capable of carrying, 6,000 tons. The rate of a cent per bushel on wheat from Chicago to Buffalo is not now unusual. At thirty-three bushels to the ton, this is but one-third of a mill per ton mile, or one-twenty-seventh the average railroad rate.

The success of the whaleback C. W. Wetmore was such as to cause other parties to engage in the construction of additional vessels of this type, both here and abroad, with promise of still greater efficiency.

These astounding results are attributed to the great efficiency of marine steam engines, and to great capacity for storing the paying load, so that notwithstanding the long haul over non-productive waters the ocean carrier is out of reach in the competition with the land lines; in fact there can be no competition, for the two are reciprocal and mutually beneficial.

The marine engine requires only one-half ounce of coal per ton mile, or a ton of coal would produce 64,000 ton miles of ocean carriage at freight speed, while the same amount of fuel will only produce 10,000 ton miles on a railroad, or about one-seventh as much.

From whatever standpoint, therefore, the question be viewed it would seem that even with the improved efficiency of the railroads, which it is stated was increased last year over 60 per cent., they are not able to cope with the unpretentious and antiquated system of canal transportation, and the attempts which are systematically made to obliterate our canal routes, limited though they are, would be a calamity to the nation as well as to the railroads, for manufactures and commerce would be restricted by increased taxes in the form of higher tariffs.

The proposed convention in the interest of canals, to be held in the Empire State, has been called none too soon, and the prosperity of the country would be greatly enhanced if a more general interest were manifested in enlarging our great systems of waterways and in bringing them into more intimate co-operation by improving their connecting arteries. It has been shown by statistics that the $30,000,000 expended on the improvements on the great lakes have effected an economy in the freight moved in one year of more than three times the total cost. Surely there are few, if any, expenditures of the Government that can produce a better result than this of the river and harbor bill.—*Lewis M. Haupt.*

Manufacture of Parchment Paper.

An English inventor has brought forward an improved apparatus to be used in the manufacture of vegetable parchment, in which the paper to be converted into parchment is passed through a number of baths containing dilute sulphuric acid, water and glycerine. It has for its object to provide an apparatus which will perform its work in a continuous and automatic manner, and which will need very little attention.

In carrying out the invention the paper is supported in the form of a roll above the end of the first tank or bath, which has a partition dividing it into two parts, the first one containing sulphuric acid diluted to the required strength, and the second one water. The paper as it is unrolled passes through the vitriol bath, then over glass rollers and scrapers and through the water, passing between pressure rollers after it emerges on its way to the other baths. The paper then passes through one or more baths containing water, pressure rollers being provided for each, as in the first water bath, for taking out all moisture possible.

After all traces of acid have been thus removed the parchment is passed into the last bath, containing glycerine of the required consistency, thence to a roller on which it is wound, being passed afterward over a series of drying cylinders to the cutting machine to be cut into sheets of the required dimensions. Instead of being rolled after passing from the glycerine bath it may pass direct to the drying cylinders, but the former method is preferred.

The pressure rollers are of india rubber or other suitable material, and may be covered with felt. They are adjusted by springs, screws or levers to the required pressure, and are driven at the same speed by means of belts connecting them together. The roller upon which the parchment is wound after passing through the glycerine is driven by means of friction gearing, which can be regulated to give the desired pull on the material, and which will allow for the increasing size of the roll as the sheet is wound on. Guiding rods are placed in and on the top of the tanks, extending across, then under, and over which the material passes, and a number of pipes are arranged to throw a strong spray of water on the paper as it passes over the rods and rolls.

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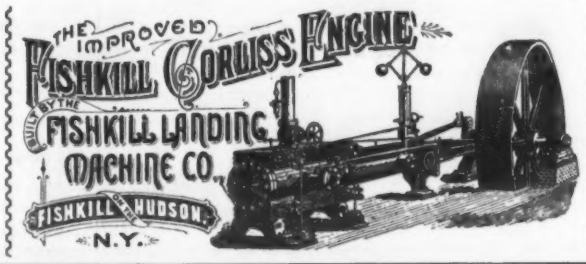

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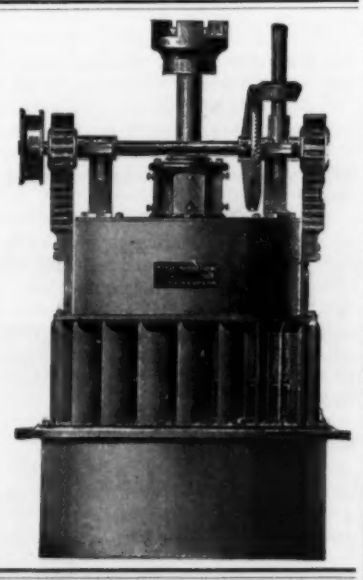

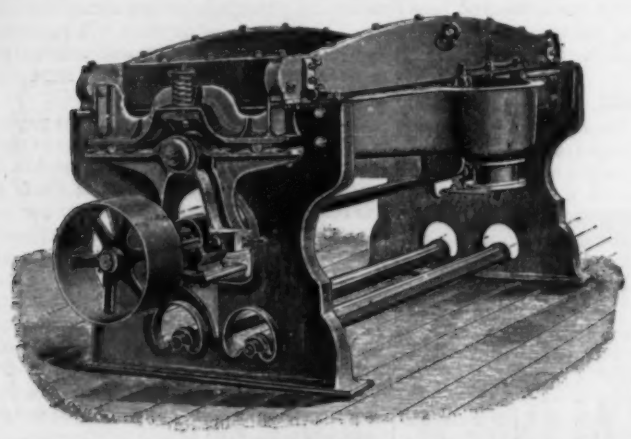

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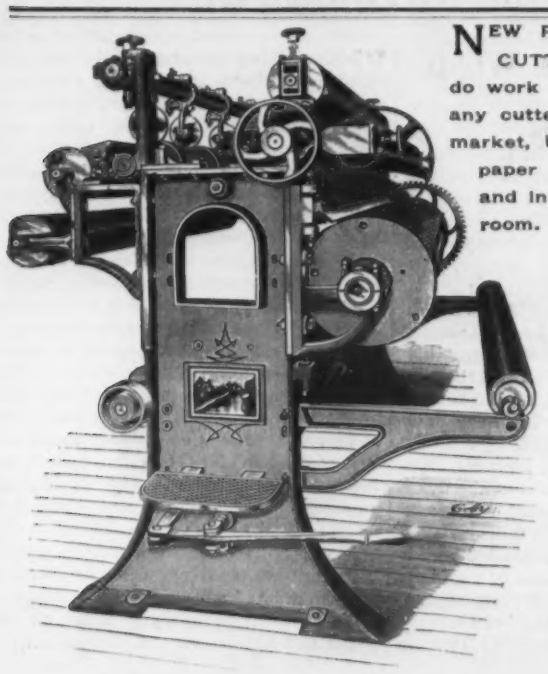

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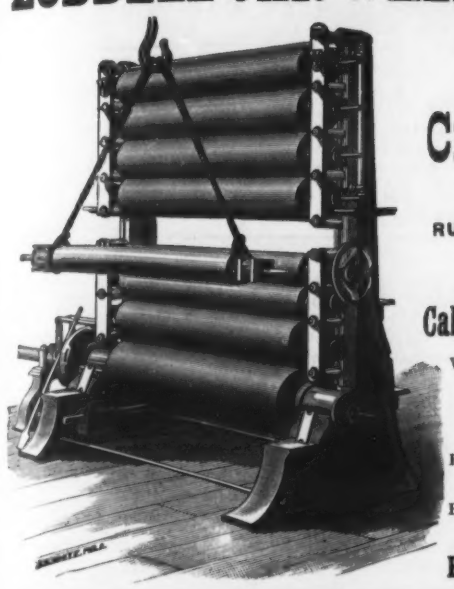

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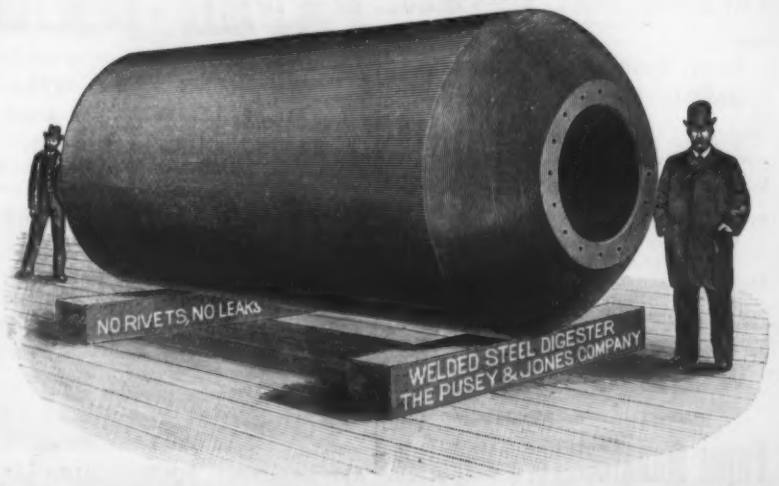

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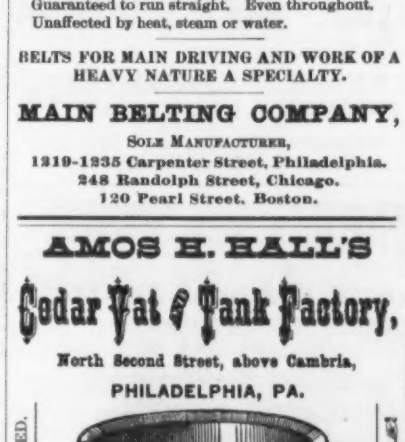

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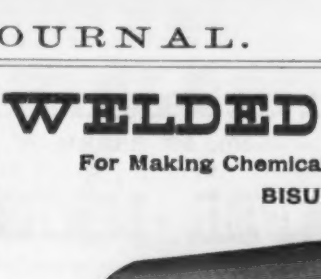

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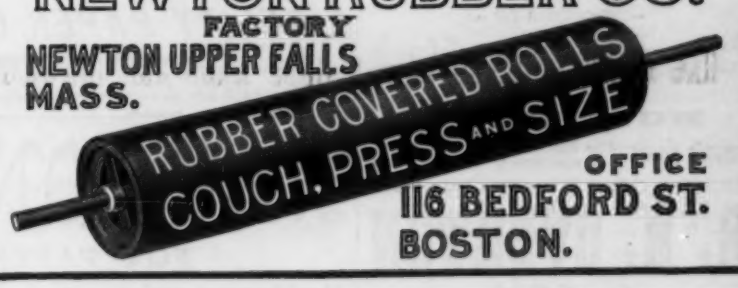

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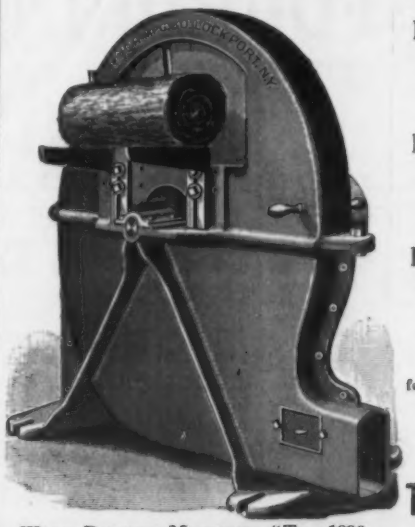

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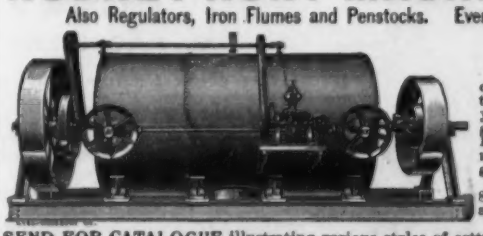

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